Societal impact, interaction and scientific quality?

Strategic research from participants' perspective

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Tiivistelmä – Referat – Abstract

During recent years, science policy has increasingly addressed the societal impact of science. Programmes that highlight transdisciplinary interaction, and finding solutions to grand challenges, have emerged globally. Strategic Research Council (SRC) is a funding instrument that was founded as part of the renewal of state research institutes in 2015. It emphasizes these trends in the projects it funds. The thesis looks at strategic research from participants' perspective. The aim is to shed light on how strategic research, with its new criteria, looks like among researchers from diverse academic backgrounds, and what may be concluded about research environment changes in general. To achieve this aim, the thesis seeks answers to the following research questions: What kinds of similarities are there among participants' adaptation to the programme? Are there differences in participants' adaptation to the programme, and if there are, where do these differences derive from?

The empirical data of the thesis consisted of semi-structured interviews with researchers who have participated in the SRC programme (N=15). The interview data was analyzed with grounded theory methodology, and by linking the findings to relevant previous research literature around the phenomenon. In particular the concept of boundary object by Susan Leigh Star and James Griesemer, and the concept of articulation work by Anselm Strauss, were utilized in construing and analyzing the findings. By utilizing these concepts, different characteristics of strategic research were recognized. They concretized in different ways depending on the context, and caused some of the researchers to practice more articulation work.

The analysis indicates that, regardless of researcher's background, the characteristics of strategic research enable it to be applied in flexible ways within diverse contexts. Researchers may include various research subjects and approaches under the vague research framings. Hence, researchers are able to, for example, continue investigating the same research subject as before. With the help of strategic research's boundary object-like flexibility, participants can also justify, include and defend various activities, needs and motivations, and increasingly communicate with actors of diverse backgrounds. This enables the discussion between various actors, and enhances understanding of the different sides to phenomena. The vague characteristics of strategic research also, however, result in inflexible forms that come across as different types of contradictions. The differences in adaptation indicate that contradictions emerge, for example, as a result of experienced exclusion in cross-disciplinary collaboration, due to one-sided conceptualization of impact. In the light of the data, certain research fields' and state research institutes' conceptualizations of impact, for example, ones that are more easily measured quantitatively or in a shorter time-span, gain a more dominating position in some projects, leaving the respective conceptualizations of social sciences and humanities at the university to the margin. In addition, controversies emerge from compatibility issues regarding dissimilar incentives, interests and conventions. For some the participation causes notably more contradictions than for others. Hence, strategic research may also look very different for researchers of dissimilar backgrounds. The most important factors for the observed differences appeared to be different academic orientations and interests, project types, collaborating partners, career phases and power relations.

It can be concluded that the inclusion of different research approaches does not necessarily guarantee that they will equally be taken into account in common problem-solving. Integrating different approaches and perspectives can be challenging, especially when schedules are tight. In addition, in spite of the increasing communication between various actors, for some, especially the early-stage researchers, interaction seems to be lacking. Even when a shared space is engineered between various actors, the changes in the nature or principles of research might not, in the end, be that profound within research groups. The programme's emphasis of interaction and impact also brings along work and participation opportunities that are external to the actual conduct of research, which provokes several questions among researchers regarding career progression and project management. In balancing between different commitments, motivations and interests, researchers practice varying amounts of invisible articulation work. Based on the data, it is important to take into account the invisible work and diversity regarding the societal impact of science, as well as increase mutual reflexivity.

Avainsanat – Nyckelord – Keywords
Science policy changes, Strategic research, societal impact and interaction, boundary object, articulation work

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Tiivistelmä – Referat – Abstract

Tiedepolitiikassa on viime vuosina alettu kiinnittää yhä enemmän huomiota tutkimuksen yhteiskunnalliseen vaikuttavuuteen. Monialaista ja monitieteistä vuorovaikutusta, yhteiskunnallista vaikuttavuutta ja haastekeskeisyyttä painottavat tutkimusohjelmat ovat lisääntyneet globaalisti. Strategisen tutkimuksen neuvosto (STN) on tutkimuslaitosuudistuksen yhteydessä vuonna 2015 perustettu Suomen Akatemian rahoitusinstrumentti, jonka rahoittamissa strategisen tutkimuksen hankkeissa nämä painopistealueet näkyvät selkeästi. Tutkielmassa tarkastellaan strategista tutkimusta osallistujien näkökulmasta. Tutkielman tavoitteena on selvittää, millä tavoin strateginen tutkimus uusine kriteereineen näyttäytyy erilaisista akateemisista taustoista tulevien tutkijoiden keskuudessa, ja mitä sen pohjalta voidaan päätellä tutkimuskentän muutoksista laajemminkin. Tutkielmassa pyritään tähän tavoitteeseen etsimällä vastauksia kahteen tutkimuskysymykseen: Mitä samankaltaisuuksia osallistujien sopeutumisessa strategisen tutkimuksen ohjelmaan on havaittavissa? Onko osallistujien sopeutumisessa eroavaisuuksia, ja jos on, mistä ne johtuvat?

Tutkielman tutkimusaineisto koostui ohjelmaan osallistuneiden tutkijoiden puolistrukturoiduista haastatteluista (N=15). Haastatteluaineisto analysoitiin aineistolähtöistä menetelmää hyödyntäen, kytkemällä aineistosta tehdyt havainnot aiempaan aihepiirin tutkimuskirjallisuuteen. Tämän lisäksi havaintojen jäsentämisessä ja ilmiön tarkastelussa sovellettiin erityisesti Susan Leigh Starin ja James Griesemerin rajaobjektin käsitteistöä sekä Anselm Straussin artikulaatiotyön käsitettä. Näitä käsitteitä hyödyntämällä aineistosta tunnistettiin erilaisia strategisen tutkimuksen piirteitä, jotka toteutuvat eri tavoin kontekstista riippuen, aiheuttaen osalle tutkijoista suurempia määriä artikulaatiotyötä.

Analyysi osoittaa, että strategisen tutkimuksen piirteet mahdollistavat sen joustavan soveltamisen erilaisissa konteksteissa tutkijan taustasta riippumatta. Tutkijoiden on mahdollista sisällyttää monenlaisia tutkimusaiheita ja lähestymistapoja laajojen tutkimusteemojen alle. Tutkijat voivat siten jatkaa muun muassa tutkimusaiheensa parissa samaan tapaan kuin aiemmin. Strategisen tutkimuksen rajaobjektimaisen joustavuuden avulla osallistujat voivat myös oikeuttaa, sisällyttää ja puolustaa monenlaisia aktiviteetteja, tarpeita ja motivaatioita, sekä lisääntyvissä määrin kommunikoida eri taustoista tulevien toimijoiden kanssa. Tämä mahdollistaa eri toimijoiden välisen keskustelun, yhteistyön ja tutkimusilmiöiden eri puolien ymmärryksen lisääntymisen. Strategisen tutkimuksen laveat ominaisuudet saavat kuitenkin myös joustamattomia muotoja, jotka näkyvät aineistossa erityyppisinä ristiriitoina. Erot sopeutumisessa osoittavat, että ristiriitoja syntyy muun muassa koetusta ulossulkemisesta tieteiden välisessä yhteistyössä vaikuttavuuden yksipuolisen käsitteellistämisen seurauksena. Aineiston perusteella tiettyjen tutkimusalojen ja tutkimuslaitosten vaikuttavuuden käsitykset, esimerkiksi nopeammalla aikavälillä havaittavissa olevat ja kvantitatiivisilla mittareilla helpommin mitattavat, saavat osassa hankkeita hallitsevan aseman, jättäen humanistisen ja sosiaalitieteellisen yliopistotutkimuksen vaikuttavuuden käsitykset marginaaliin. Tämän lisäksi ristiriitoja syntyy toisistaan eroavien kannustimien, intressien ja käytäntöjen yhteensovittamisen ongelmista. Osalle ohjelmaan osallistuminen aiheuttaa siten huomattavasti enemmän ristiriitoja kuin toisille. Strateginen tutkimus voi samaan aikaan näyttäytyä eri taustoista tuleville tutkijoille myös hyvin eri tavoin. Tärkeimpiä tekijöitä havaituille eroille ovat etenkin erilaiset akateemiset orientaatiot ja intressit, projektisuuntaukset, yhteistyöpartnerit, uravaiheet ja valtasuhteet.

Aineiston valossa voidaan päätellä, että erilaisten lähestymistapojen mukaan ottaminen ei välttämättä takaa näiden tasapuolista huomioimista yhteisessä ongelmanratkaisussa. Erilaisten lähestymistapojen ja näkemysten integroiminen voi olla haastavaa, etenkin aikataulujen ollessa kiireisiä. Huomionarvoista on myös se, että kommunikaation monipuolisesta lisääntymisestä huolimatta osalle, etenkin aloitteleville tutkijoille, vuorovaikutus näyttäytyy vähäisenä. Vaikka yhteinen kommunikaatiotila luodaan eri toimijoiden välille, eivät tutkimuksen luonteen tai periaatteiden muutokset välttämättä ole merkittäviä tutkimusryhmien sisällä. Ohjelman vuorovaikutus- ja vaikuttavuuspainotus lisää myös varsinaisen tutkimuksen ulkopuolista työtä ja osallistumismahdollisuuksia, mistä tutkijoilla herää monenlaisia kysymyksiä urankehitykseen ja projektinhallintaan liittyen. Tasapainotellessaan erilaisten sitoumuksien, motivaatioiden ja intressien välillä tutkijat tekevät vaihtelevia määriä näkymätöntä artikulaatiotyötä. Tutkielman valossa näkymättömän työn parempi huomioiminen, sekä vaikuttavuuden moninaisuuden sanoittaminen ja keskinäisen reflektion lisääminen nousevat tärkeiksi seikoiksi.

Avainsanat – Nyckelord – Keywords
Tiedepolitiikan muutokset, Strateginen tutkimus, yhteiskunnallinen vaikuttavuus ja vuorovaikutus, rajaobjekti, artikulaatiotyö

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1. Introduction

Although the overall quest for utility value and relevance of science is not a new issue (Hessels, Van Lente & Smits 2009, 387-388; Calvert 2006, 203; Pielke 2012, 7-8; Goeminne 2011, 627-628), during the at least last thirty years, a change has occurred in the way different expectations are addressed, framed and implemented into science policy requirements (Molas- Gallart 2015, 112). Through the assessment of impacts, there is an increasing demand to assure the relevance and importance of research early on (Molas-Gallart 2015, 112-113; Calvert 2006, 203). In addition to increasing impact assessment within funding organizations at a more general level, also new programmes and funding instruments emphasizing these requirements have emerged (De Pryck & Wanneau 2017, 203; Felt et al. 2016, 732; see also EU Horizon 2020). For example, calls for transdisciplinary research, collaborative research, team science, sustainability science, joint research, and strategic research among others have appeared globally. They often highlight the importance of societal impact and interaction, and finding solutions to complex societal problems without, however, compromising the excellence of science, its high quality and publication efficiency. The inclusion of various actors from diverse disciplinary and sectoral backgrounds is increasingly emphasized, potentially exposing actors to new situations, perspectives, ways of working and thinking (Rask 2008, 22; Thompson et al. 2017, 31).

Academy of Finland's Strategic Research Council (SRC) that was founded as part of the Renewal of Research Institutes in Finland in 2015 emphasizes these development trajectories in the programmes it funds. It calls for inter- and transdisciplinary interaction as a means for impact, high quality science and need for research-based decision making, societal relevance as well as creation of solutions to complex societal problems. This thesis aims to shed light on strategic research through the perspectives of participating researchers. I study strategic research "at work" and aim to understand how participants interact with the SRC programme's characteristics. I seek to answer to the following two research questions: *1) What kinds of similarities are there among participants' adaptation to the programme? 2) Are there differences in participants' adaptation to the programme, and if there are, where do these differences derive from?*

It may be assumed, that the changes in science policy landscape have an impact on the work of academics (Ylijoki 2008, 76; Bornmann 2011; Weingart 2005). There are, however, diverging discourses, evidence and ambiguity with regard to the actual process, profoundness, straightforwardness and nature of change in practice (e.g. Hessels et al. 2009; Tuunainen & Knuuttila 2009; Gibbons et al. 1994). This makes hearing the experiences and perceptions of researchers participating in a programme relating to these discussions very interesting. Overall, academics seem to be working under increasing, sometimes inconsummerable and conflicting requirements and expectations (Aarrevaara & Dobson 2015; Ylijoki 2013, 243; Pietilä 2018, 81-82). Although there is a noticeable amount of theoretical research literature on overall changes in research environments and knowledge production, there is still a fairly limited amount of local empirical research on new programmes and schemes that emphasize collaboration with pre-given aims. If these kinds of programmes are to become more common through science policy changes, it is important to know what the development means regarding research environment. Furthermore, many authors (e.g. Felt et al. 2016, 734; Thompson et al. 2017, 31; Möllers 2017) argue that studying participants' experiences and perspectives is needed in order to better understand these approaches and the dynamics of collaboration within different contexts. It has also been noted that although scientific collaboration between different disciplines is becoming increasingly popular, it still often happens through disciplines that are close to each other. Collaboration combining researchers from, for instance, social and natural sciences is still fairly rare (Porter & Rafols 2009, 721; Brister 2016, 82).

According to Oili- Helena Ylijoki (2008), the active position of an individual is often ignored in research concerning higher education research and policy. Furthermore, scientists should also be seen as actors who engage in decision-making and in directing outcomes. There remains a gap to fill in for research looking at how policy implementation affects the daily work of researchers without perceiving them as mere victims of external demands. (Ylijoki 2008, 76.) The relevance of the subject also relates more generally to different factors that have been addressed as important reasons for studying science. Mika Kiikeri and Petri Ylikoski (2011) discuss different justifications that have been presented for this importance. Science can overall be seen as an inherently important and interesting issue to study in order to understand it better but also as an object of study that has variety of societal and practical aspects of relevance. For example, by studying the different aspects of a research system it may be easier to follow and estimate science policy decisions and programmes based on publicly funded research.

Since the outcomes of scientific and technological developments have become more and more important in our daily lives, the tools for analyzing science, its results and representatives are an important object of research and development, also to be used by various audiences to increase understanding. The ethical issues related to science and its applications (e.g. Karvonen 2014) also require a better understanding. Through studying the actual research work and potential solutions, these issues may be better addressed and solved. (Kiikeri & Ylikoski 2011, 20-21.)

The empirical data of the thesis consists of SRC researcher interviews (N=15) that have followed a thematic semi-structured format. The data was analysed with grounded theory methodology (Glaser & Strauss 2006), using a data-driven approach. The aim of the thesis is not to evaluate the programme or the answers of researchers but to construct a condensed picture of a part of the phenomenon in its own particular context. In analysing my findings, I used the concept of "boundary object" (Star & Griesemer 1989), and "articulation work" (Bowker & Star 1999; Strauss 1985) among their neighbouring concepts as analytical tools.

My interest in the subject matter arouse initially when I was working as an intern at the Strategic Research Unit in the Academy of Finland in the spring of 2017. I found the internship to be highly interesting and had an opportunity to look at how complicated and challenging the assessment of societal impact of science may be, in particular as taking into account researchers' diverse backgrounds, project profiles, and activities among other things tends to make the assessment very complex. I became interested in hearing about researchers' experiences more, especially with regard to the changes in their actual research practices as a consequence of their participation in SRC projects. After the general interest in further studying the issue, I chose the topic with the help of my supervisors.

I hope that the thesis may help in gaining a better understanding on the diversity of perspectives and experiences: the ways of seeing and working involved in the strategic research programme. These perspectives help to understand strategic research as an institution. Institutions do not function in isolation but are "humanly produced, constructed objectivity" and hence the relationship between participants and the objectivated end-result is a "dialectical one" (Berger & Luckmann 1991, 78). Shedding light on the participant experiences may also increase awareness on best practices as well

as tensions and difficulties that researchers have perceived. It is apparent that this study presents only a limited picture of the overall perspectives involved. By focusing on the similarities and differences I, however, aim to take into account different situations that would likely be present in a bigger group of informants as well. Hearing participants may also help to bridge gaps in communication and collaboration. It is important to raise voices from diverse backgrounds. In one of my interviews it was noted that as an individual researcher it may not be favorable to publicly say something that is against the collective view of the project. This shows that interviewing participants individually is in some cases necessary in order to grasp a profound picture of diverse situations. As the discussion on the changes in science policy and knowledge production tends to be very diverse, it is interesting to see how the participants of a programme addressing these trends perceive them.

The thesis will progress as follows. I will first discuss some of the main macro-level science policy-society changes and theories around them in a global and national context. This section provides an overview to the overall context of strategic research, from where I move on to present the programme in more detail. In the third section, I will present my theoretical approach and a synthesis of previous research literature regarding science policy changes in local contexts. In addition, I will present the main theoretical concepts that I use throughout the analysis: boundary object (Star & Griesemer 1989) among its neighbouring concepts. In the fourth section, I will present my data and analysis method. In the fifth section, I will discuss the results of the analysis in four different sub-sections. In the sixth section, I will summarize the main findings of the thesis and attach them to the larger context and discussion around the findings.

2. The context of strategic research

In this chapter I present research literature and theories about the wider context of strategic research, focusing on the changes in the science-policy-society landscape, first on a global scale and then more specifically in the context of Finland. I also present the renewal of state research institutes and the funding instrument Strategic Research Council (SRC).

2.1 Science-society relationship in transformation?

Even though the expectations on relevance and benefits of science[1] have in the last few decades been increasingly emphasized in the funding schemes and research agendas, these expectations are not, however new. They have been acknowledged and addressed for already a long period of time. (Calvert 2006, 202-203; Pielke 2012; Bornmann 2012, 673; Molas-Gallart 2015, 112; Hessels et al. 2009, 387.) Steven Shapin (1999) has studied the history of science, shedding light on its very early developments. The expectation for utility was already in this early phase (17th and 18th century) a very important aspect in making the matters of new scientific practices appealing. For example, Descartes criticized contemporary medicine to be insufficient in managing health issues, and believed that "a proper causal knowledge of the body (on mechanical principles) would aid in preserving health and prolonging life" (Shapin 1999, 140). Quite close ties between mathematics and technological development may be traced already in antiquity. Historians have not, however, come to consensus on how broadly the early scientific practices actually affected the development of technology that would have resulted in economic benefits. Even though it is likely that many of the early visions did not actualize in practice, early scientific development and interests created many resources for practical use. (ibid., 1999, 140-141.)

The conditions for conducting science have overall changed historically alongside different environmental and societal developments. The expectations for science tend to depend on the understanding of the situation at hand, of the factors behind it and of the solutions available for changing direction accordingly (Muhonen & Puuska 2014, 12). When looking at the developments in research funding since the World War II to the

[1] The English word science with an emphasis on life sciences can be seen as a bit narrower than the Finnish equivalent (Kiikeri & Ylikoski, 15-16) but I include different fields of research when using the concept. It may be argued that not all of research and its activities are science and that some research is rather application of science (Immonen 1995). Research may also relate to, for example, research and development work (R & D) which as a term emerged through OECD- recommendations in the 1960s (ibid., 15-16). By using the concepts of research and researchers I do not make a statement in the discussion on the potential shift from the "culture of science" to "culture of research" and more recently to "culture of knowledge" (Jacob 2005, 202-203, Latour 1998).

current day, the view on how to best support the progress of science and its outcomes has changed. After the World War II and the several following decades, funding was directed to "basic research". Benefits and impacts of science were seen to most likely appear when autonomy of researchers was preserved. (Stokes 1997, 1; Calvert 2006, 202-203; Pielke 2012; Rask 2008, 27; Bornmann 2012, 673.)

Basic research as a term was first used already around 1920's but became increasingly popular after the war due to public recognition and its flexibility in various contexts of usage (Pielke 2012, 339-341, 345-346). Scientific advisor Vannevar Bush, among others, promoted the term further. During the war, scientists worked with military and assisted in developing military technologies. This collaboration showed the power that scientific development may have. Subsequently, science became increasingly recognized and supported. Therefore, many of the grand scientific achievements actually relied on military funding. There were also many research projects as exceptions to the case but military funding was a notable enabler of further knowledge generation. (Hacking 1999, 167-169; Pielke 2012, 345-346; Calvert 2006, 202; Bornmann 2012, 673.)

Science was subsequently legitimated with public funding and the autonomy of a researcher was often emphasized. This was, however, an idealized picture when looking at the research agendas. Scientists were simultaneously quite tied to working for external aims, such as the atomic bomb. The possibility to concentrate on conducting research with public funding was, however, secured by the idea that basic research has a vital position in technological innovation and would best operate without distracting scientists. (Calvert 2006, 202-203; Hacking 1999, 167-169.) During the time, it was widely seen that science as an institution has to have autonomy and knowledge can be sought after for its own sake (Miettinen & Tuunainen 2010, 8). Robert K. Merton's ([1942]1973) ethos for modern science was influential in constructing an ideal picture of scientific progress. The so- called CUDOS- norms identified "communism, universalism, disinterestedness and organized skepticism" as guiding principles of science.

As it was at the same time common to see "pure basic research" as a source of innovation and technological progress, innovation researchers and economists have afterwards indicated this phase as the "linear model of innovation" (Miettinen & Tuunainen 2010, 8-9). According to the model, basic research is the main starting point for innovation, which then causally proceeds into applied research. Product development is seen as the

final phase of the chain. (Godin 2006, 639-640; Flink & Kaldewey 2018, 14; Miettinen 2002, 13.) Despite its influence, which may still be observed today, the model has been widely criticized. The perception of linearity has been challenged by many authors who argue that it ignores the multiple phases, actual nonlinearity and complexity of the innovation process (e.g. Fagerberg 2009, 8-9; Godin 2006, 659). This model was influential especially between 1950s and 1980s (Flink & Kaldewey 2018, 14).

The concepts of basic and applied research can be seen to have played a significant role in the emergence of science and technology policy[2] after the World War II. They have and are still largely used as symbolic tools and rhetoric resources in science and technology policy, despite the criticism that this categorization between sciences has faced. (Miettinen & Tuunainen 2010, 7- 8; Stokes 1997; Pielke 2012; Gundersen 2018, 53.) It can be argued that in most cases, science consists of both a profound understanding of a researched phenomenon as well as the motives for utilization. Hence, it has been suggested that "use-inspired basic research" (Stokes 1997) could be a more feasible term for defining research, instead of strongly dividing it into different categories. The different aims and definitions of science can be observed through Donald Stoke's (1997) famous "Pasteur's quadrant" in which the idea of use- inspired basic research is also presented. The model shows how the categories of "pure applied research" (solving practical problems and utilization of research) and "pure basic research" (enhancing scientific understanding without the interest of utilization) overlap and often exist simultaneously. Different fields of research, in spite of this, often may have clearly divergent profiles.

Overall, different science policy concepts are powerful in that they can be used by various groups for diverse aims, interests and agendas (e.g. Godin 2009, 494; Flink & Kaldeway 2018, 14-15; Calvert 2006; Miettinen 2002). When taken up and used by different groups, a concept may become "an instrument of governance" or a "powerful organizing

[2] Veronica Stolte-Heiskanen (1988) defines science policy as governments' collective operations which focus on 1) enhancing the prerequisites or conditions for science through policy and 2) the promotion of different policies through science, and additionally technology, innovation and research. Merle Jacob (2005, 202) argues that the concept of science policy may be outdated since various different concepts such as "research and innovation policy" have become more common. Moreover, the usage of the concept has evolved continuously (Immonen 1995, 16-17).

metaphor" (Miettinen 2002, 14). They can also sometimes be called boundary objects that enhance interaction without consensus (Star & Greisemer 1989) – a concept that I will present and utilize later in the thesis. Coming to the 1990s, "linear model of innovation" started to lose its popularity, and debates around the sources and progress of innovations resulted in a view looking at innovation as an interactional process (Miettinen & Tuunainen 2010; Miettinen 2002, 13).

The concept of "the National Innovation System" (NIS) became influential around the end of the 1980's. According to Benoit Godin (2009), the concept entails that innovation is the main aim of a research. In this approach, research system functions within a broader system of different sectors: For example, university and government that interact with each other. These interactions are seen as determinants of the system's performance success. NIS can be seen to have shared features with the earlier "systems approach". Systems approach highlights "technological innovation and its economic dimension and urge all sectors to contribute to this goal- under their respective roles". NIS however views "the firm as its main component, around which other sectors gravitate." (Godin 2009, 476-477, 494.) Science policy started to become increasingly intertwined with innovation and technology policy since around the 1990's (Hautamäki & Ståhle 2012, 9; Immonen 1995, 3; Alastalo, Kunelius & Muhonen 2014, 120). Subsequently science has become to be evaluated more strongly through its economic competitiveness and utilization potential. According to Hautamäki and Ståhle, this development has devalued other social and societal purposes of research (Hautamäki & Ståhle 2012, 9), and added pressure to the legitimacy of funding basic research (Calvert 2006, 203).

Various theoretical approaches and models have addressed these developments. According to the theories, science-society relationship is currently going through visible changes regarding the structural conditions for as well as the changes in scientific production. These approaches relate to similar kinds of ideas under different conceptualizations, and they have also participated in shaping the changes. Silvio O. Funtowicz and Jerome R. Ravetz (1993) speak of a new kind of "post-normal science" that aims to solve different kinds of issues stemming from uncertainties, such as environmental issues. They emphasize the importance of including a larger amount of actors with diverse perspectives in assessing the quality of scientific results. They argue that traditional ways of working are no longer enough in situations that include "complex

risks, profound uncertainties, high stakes, urgency of decisions and broadness of legitimate perspectives". (Funtowicz & Ravetz 1993, 739, 744.)

Michael Gibbons and colleagues (1994) argue that a shift is taking place from "Mode 1" to "Mode 2" knowledge production through which utilization value and applicability become more valued instead of the focus on scientific progress and seeking knowledge for its own sake. They state that Mode 1 is more discipline-based and academic and Mode 2 a more context- and issue- driven way to produce knowledge. (Gibbons et al. 1994, 3-7.) Other similar approaches are called "post- academic science" (Ziman 1996) and "socially robust knowledge" (Nowotny 2003). "Triple Helix" is a model that has been presented by Henry Etzkowitz and Loet Leydesdorff (1998). It suggests that universities, governments and companies have become interconnected in a new way. This interconnectedness is seen to blur the division of tasks between these institutions. As a result, commercialization and economic development are seen to form "a new mission for the university" which they also call "the entrepreneurial university". (Eztkowitz & Leydesdorff 1998, 197.) A similar kind of idea with a different perspective is presented by Sheila Slaughter and Gary Rhoades (2004) with a concept of "academic capitalism" as well as a theory around it. It entails that the spheres of private and public have become more interconnected through the emergence of networks with their new organizational forms, market habits and relations, making universities a more inherent part of "the new economy" (Slaughter & Rhoades 2004, 11, 15).

The theories and models have attracted much discussion and there is a wide array of literature on them. They have, however, been also criticized for being too simplifying and not taking into account local contexts as well as the diversity of academic research. It has been pointed out that the changes might not in reality be as profound and linear since they are lacking empirical and theoretical footing. Criticism also relates to the uncritical and often normative legitimation of the potential developments. It has been stated that even though the aim is to see basic and applied research as increasingly intermingled, the theories often end up renewing their separatedness. Accordingly, disciplinary differences and the multi-faceted nature of science's impact are not taken into account enough. (Tuunainen 2013, 65-66; Weingart 1997; Knuuttila 2012; Hessels et al. 2009, 387-389.) It has also been questioned whether science has ever been in isolation, away from the context of appliance or something normal since politics are always present in science (e.g. Latour 1987; Goeminne 2011; Callon et al. 1986).

With the increasing emphasis on societal impact assessment and the emergence of new programmes and funding schemes it, however, seems like there is now more science policy emphasis on the kinds of trajectories that the authors have suggested. Some of the new research programmes and research fields that have emerged in recent years have also gotten inspiration from the ideas of the Mode 2 and other similar approaches. For example, Lang and colleagues explain this is the case with sustainability science (2012, 26). According to Juha Tuunainen and Tarja Knuuttila, based on empirical research literature, it is visible that academia and industry have gotten closer to each other (Tuunainen & Knuuttila 2009, 687). Many authors claim that overall, a clear trend in the growing amount of different aims and demands directed towards science can be observed, and science's societal impact and interaction with society has increasingly been addressed in the 21st century (Väliverronen 2016, 103-104; Rask et al. 2018, 3-4; Huutoniemi 2014, 13).

This change is often indicated to as the new "social contract" through which science is increasingly being held accountable for showing its social and economic outcomes and benefits early in the research process (Molas-Gallart 2015, 112-113). The impact assessment of science that was originally developed at measuring merely the economic impacts and excellence quantitatively has broadened to account for broader societal and social developments, also utilizing qualitative indicators (Miettinen et al 2015, 270; Molas-Gallart 2015, 113). This is also indicated by the emergence of the concept "social innovation" through which the concept of innovation may perhaps relate to more diverse meanings of well-being and development (Hautamäki & Ståhle 2012, 62). Mikko Rask and colleagues (2018) address that overall there are various commitments that science is suggested to account for, from publication efficiency to inclusiveness with regard to various actors. At the same time, however, researchers have to face an increasing competition over scarce resources and may often end up managing these pressures without enough institutional backing. (Rask et al. 2018, 3.) For instance, the attitude and criteria of "publish or perish" shifts the focus strongly on quantity as an indicator of success. This adds pressure for scientists to be able to produce and publish papers in a very, and often problematically, fast schedule. (Rawat & Meena 2014, 87-89.)

There is a broad variety of concepts that have emerged in science policy within the last few decades. In addition to the above-mentioned, for instance, strategic research,

responsible innovation, joint research, transdisciplinary research, sustainability science, frontier research and grand challenges have appeared and been implemented in higher education institutions and research organizations. Tim Flink and David Kaldewey (2018, 19) speak of "a pluralization of STI[3] policy discourses" as a phenomenon that has taken place in recent years. When looking at the history of science policy concepts, David Kaldewey (2018) argues that there has been a shift from crucial problems (during the 1960s) to challenges: to grand challenges that energize and motivate actors. Grand challenges may have a more positive tune in comparison to prior policy discourses: they are perceived as manageable or achievable. Kaldewey also indicates to this new discourse as the "sportification of science" on the basis of the expressions that are withdrawn from competitive schemes of sports. According to him, the traces of the discourse are, however, already very visible in 1960s and 1970s for instance, in "mission oriented" research. Grand challenges have, however, become distinct in how widely the discourse has become implemented across disciplines and institutions. (Kaldewey 2018, 167-170, 177.) These features are also visible in European Union's upcoming Framework Programme 9 through which research missions, also called moonshots, are launched. "Missions should be ambitious, even risky, but also realistically feasible" addresses Mariana Mazzucato, "the director of University College London's Institute for Innovation and Public Purpose", who advises EU research commissioner Carlos Moedas on moonshots (Kelly 2018).

Jane Calvert (2013) suggests that the concept of grand challenges may perhaps include a broader scope of research terms and activities than the discourses of 1980s and 1990s. In relation to grand challenges, she addresses that even though strategic competition regarding national leadership positions in technological and economic development are still to be seen, there now also seems to be attempts to widen the image around the purposes of the research system. (Calvert 2013, 475-476.) Another concept that has appeared recently in science policy language, becoming a key issue in the current framework programme Horizon 2020, is "Responsible Research and Innovation" (RRI) (Owen, Macnaghten & Stilgoe 2012, 751). RRI suggests that new responsibilities are delegated for all the participating actors (Rip 2014, 8). It aims at enhancing responsiveness "for inclusive deliberation concerning the direction of travel for science and innovation- from the outset- opening up opportunities for these to be directed towards socially desirable ends" (Owen et al. 2012, 754). Arie Rip explains that in the beginning

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of the 2000s this discussion started with nanotechnology and the concerns around its development with regard to negative consequences as well as resistance towards further technological development (2014, 7). In relation to the overall development of responsibility in science policy language, he speaks of a change in the "division of moral labor". According to this view, roles of participating actors within science and technology development may be altering. (Rip 2014, 2-3.) As prior development, for example the concepts of responsible development and responsible innovation, public engagement with science and technology assessments are suggested (Rip 2016, 291-292). The increasing diversity of people involved in decision-making with regard to science and technology development is also discussed by H.M. Collins and Robert Evans through a concept of "extension of expertise" (2002, 237) and Mikko Rask's more contextually oriented version of Collin's and Evan's concept, "expansion of expertise" (2008). They describe a phenomenon through which different actors and their diverse perspectives, also outside established elites are included in decision making around science and technology. Wider inclusion is seen to stretch the boundaries of expertise, offering a view to diverse cultures of working and thinking. (Rask 2008, 22-23.)

Inclusion may, however, also entail tensions as collaboration often includes various commitments. Responsible, among others, e.g. sustainable development are also vague terms that can be interpreted in various ways depending on their usage. Knowledge can be utilized in different ways and it always enables different developmental trajectories. This raises questions on the position and responsibility of the persons producing and using scientific knowledge. (Hacking 1999, 184; Rip 2014 2-3; Stilgoe, Owen & Macnaghten 2013.) An image of responsibility may also function as a mere legitimation stamp for the benefit of given actors. According to Rip this kind of "responsibility wash" has been present in the case of "Responsible Soy" where certification criteria has been criticized (Rip 2014, 294). In addition, Pollex and Lenschow observed in their analysis on Horizon 2020 framework documents that "where environmental and social notions of wellbeing were given attention, it occurred largely secondary or instrumental to economic growth and competitiveness" (Pollex & Lenschow 2018, 1869). For example, these kinds of issues relate to the tensions that have been discussed regarding the increasing emphasis on accountability in science policy within recent years. In the literature around the issue, there are moreover different ways of seeing and discussing these new concepts, expectations and forms of collaboration. Moreover, what their potential starting points and outcomes with regard to scientific and societal development are still remains unclear.

For example, it is suggested that this kind of agenda setting may increase evidence-based decision-making and help in making scientific knowledge more public and democratic through wider inclusion of stakeholders and actors as is the aim of public engagement (PE) and participation in science (Srinivas 2017; Rask et al. 2018). It is addressed that it may also help in questioning existing power structures and change or direct the process and outcomes of science and technology development into more environmentally and socially sustainable futures. Scientists and science organizations have been suggested to play an increasingly prominent role "in global sustainability governance" (e.g. Van Der Hel & Biermann 2017, 211). In addition, closer collaboration across disciplines and sectors in solving complex issues, such as climate change is widely seen as increasingly important (Efstathiou 2015; Brister 2016, 82; Lang et al. 2012, 25) in order to gain a more comprehensive understanding of what can be done. Some authors have suggested that the diversity and vagueness of challenges (Calvert 2013, 475) as well as the pluralization of discourses (Flink & Kaldewey 2018, 20) might actually increase the flexibility and autonomy of researchers as they can perhaps be applied to work in very diverse ways.

At the same time, there is a risk of science becoming a mere instrumental tool for different goals and aims that are decided beforehand. The emphasis on utilization and instrumentality of science raises questions on the benefitting actors in the construction of reality and relevance. (Väliverronen 2016, 105; Karvonen 2014.) Dynamics and power relations are to be analyzed within contexts where there is an increasing amount of actors with different values, interests and backgrounds participating (Felt et al. 2016, 737-738; Rosendahl et al. 2016). It has been noted that in projects with vague and complex aims, some perspectives and priorities may also end up ruling out approaches that would be very important to include in defining and solving them. Cooperation may not necessarily be responsive or inclusive of plurality. (Blok & Lemmens 2015, 22; Calvert 2013, 475; Hulme 2010, 563.) When it comes to the aims of strengthening evidence for policy, there may be a risk that a given result is chosen only when it gives legitimation for a certain policy choice (Heiskala 2016, 29).

In addition, a considerable amount of concern and criticism has been raised in relation to the new criteria and means for impact evaluation. The extension of evaluation to include societal impact is problematic since the concept is in itself very ambiguous and complex. Impact of researchers and research can be measured in various ways depending on the

criteria used and thus cannot likely be compared in a fruitful way. It is important to think about the different motives behind the growing need to evaluate the societal impact of research. (Väliverronen 2016, 103-105; Muhonen & Puuska 2014 24-25; Miettinen et al. 2015, 258.) Discussing the rightness of impacts in scientific and technological development is inherently political and always includes many value and power dimensions (Owen et al. 2012, 758). Reijo Miettinen, Juha Tuunainen and Terhi Esko (2015) state that the indicators for defining impact are limited and do not consider the existing research on the relationship of science and society in a sufficient way. In addition, epistemic missions and third missions of research are often distinguished. This is problematic since creating a vast understanding of different phenomena is also a vital prerequisite for solving complicated issues. (Mietinen et al. 2015, 258.)

2.2 Changes in Finnish science and technology policy

The global science and technology policy trends have largely been followed in Finnish science and technology policy development even though local differences between countries are naturally present (Muhonen & Puuska 2014, 12; Immonen 1995, 305; Lemola 2002, 1481). The emergence of governmental science and technology policy in Finland can be traced back to the beginning of the 1960s. Since then policies around science have started to be increasingly organized and implemented through governmental bodies. Prior to this development, different science-policy type of procedures had, however, already existed, for example, on the behalf of universities and scientific organizations aiming at improving the conditions for science. (Immonen 1995, 13; Lemola 2002, 1483.)

Finland was among the first countries in the world to adopt the concept of "National Innovation system" (NIS) as part of its science and innovation policy in the 1990s replacing the concept of research system. The concept of NIS grew into a defining label for the overall research system and the development of technology, innovations and markets began to be emphasized more strongly than before. (Miettinen 2002; Hautamäki & Ståhle 2012, 60-61; Lemola 2002, 1485.) In line with the emphasis on economic utilization and the so-called "new public management", in the 1990s results-based management and impact assessment were adopted as part of Finnish universities and science and technology policy more generally. They have brought about, often also contradictory or inconsummerable, attempts to build competitive strategies and

frameworks for forwarding the quality and impact of research and development. (Muhonen & Puuska 2014, 12-13; Hautamäki & Ståhle 2012.) Decisions at European Union's level have also influenced Finland's science and technology policy ever since 1995, when Finland became a member of the EU (Hautamäki & Ståhle 2012, 61).

In Finland, main public research actors consist of Finnish Parliament, Government, ministries such as Ministry of Education and Culture, and Ministry of Economic Affairs and Employment, Academy of Finland, Business Finland (former Tekes), universities, universities of applied sciences and state research insititutes (Suomen Akatemia 2018). Research and development work is centered mainly around universities, state research institutes, universities of applied sciences and companies. They have all traditionally had differing emphasis areas of research. In addition to research, teaching is one of universities' main tasks, state research institutes' research on the other hand includes more close collaboration with, for example, ministries, supporting their work. Supporting regional as well as business and working environment's development has been more the task of universities of applied sciences. Companies have similarly concentrated on the more applied dimension as well as on product development. The tasks are, however, not isolated and often overlap especially in the case of state research institutes and universities. Since the beginning of the 20th century, differences between research institutions have increasingly blurred nationally and globally as innovation policy and science policy have become more intertwined. (Late & Puuska 2014, 177-179.)

Universities and state research institutes have historically differed in their functions and structure, even though there are many similarities as well. In their study on research funding, personnel structure, publishing conventions and types of research in the Finnish state research institutes and universities, Elina Late and Hanna- Mari Puuska (2014) found differences between these organizations in all of the above-mentioned aspects when looking at empirical data (between the years of 2000-2010). According to their research results, universities have stronger academic orientation than state research institutes. For example, when it comes to funding source profiles, Academy of Finland is universities' most prominent source of external funding. In state research institutes majority of the external funding comes from Business Finland, ministries and companies. In addition, there are more personnel with PhD degrees in universities than in state research institutes, even though in both of them the amount of PhD's has grown in recent years. (Late & Puuska 2014, 201-204.)

Classifying research as either basic or applied may not be feasible when comparing the institutions since also the field of research affects the orientation of research and different types of research are practiced in both of them. Overall, however, Late and Puuska (2014) found that universities more commonly have academically oriented research as well as international research that is published in academic forums. State research institutes on the other hand have a more applied orientation with one of their main missions being supporting ministries' decision-making. They also have a visibly larger share of company funding than universities and publish a larger share of Finnish, as well as non-academic articles and reports. In spite of this, state research institutes' research publications had in general gathered more citations (Web of science) than university publications which is used as an indicator of scientific impact. The authors, however, add that there are many differences among disciplines and state research institutes, which affect the above-mentioned matters. Also, the conditions for conducting research may be different in the institutions as the amount of personnel on temporary, unstable contracts is larger in universities than in state research institutes, in some cases almost seven times higher. Overall, universities have in recent years received notably more research funding than state research institutes from the government. (Late & Puuska 2014, 201-204.) Both the Finnish universities and research institutes have undergone structural changes in recent years (Late & Puuska 2014, 182- 185; Rinne, Jauhiainen & Plamper 2015, 172).

The demand for accountability, efficiency and utilization has become more dominant also in the sphere of universities. For example, in 2004, societal impact was written into the university law, and became the third mission of universities (Finlex laki 2004). Rinne and colleagues (2015) state that four doctrines of Finnish universities can be seen when looking at principals' speeches. According to them, until the 1960s one can find "the doctrine of academic tradition", and from the end of 1960s until the end of 1980s "the doctrine of governmentally centered development". "The doctrine of results-based steering and competition" became prominent in the end of 1980s and 1990s onwards, and from 2000s,"the new public management's neoliberal doctrine" has been dominant. (Rinne et al. 2015, 174-175.) Risto Heiskala (2016) addresses that currently universities globally are undergoing a renewal of which impacts are most visibly affecting countries where universities' funding is relying on governments. Finland serves as an example of this development. Political and governmental management aims to increasingly define and guide the substance and development of university teaching and research. Lack of

resources adds pressure to academic principles and to prerequisites of securing the quality of teaching and other main tasks of universities. (Heiskala 2016, 30-31; Lemola 2012, 131-135.)

The states' framings and funding are still prominent in universities' functioning, even though universities increasingly rely on external funding (Muhonen & Puuska 2014, 17, Late & Puuska 2014, 184; Lemola 2012, 131). In addition, a law reform, "the universities act", that took place in 2009, being implemented in the year of 2010, gave universities more financial independence, seeing them as increasingly competitive actors (Pietilä 2018, 44-45). Government legitimated the reform by offering universities increased autonomy. Many university actors have criticized and opposed the reform. For example, the criticism relates to the reform possibly increasing market oriented managerialism and top-down governance, and decreasing internal democracy. (e.g. Ståhle & Hautamäki 2012, 70; Korvela 2013, 96-97.) At the same time, however, universities may have received more freedom to determine their own strategy (Ståhle & Hautamäki 2012, 70). The latest funding cuts by the government have resulted in a crucial amount of layoffs in universities. In addition to this, the downgrading and hostile comments by leading political members regarding science institutions and researchers, have provoked a wide array of criticism and dissatisfaction among university staff and departments.

When looking at the providers of external research funding in Finland, Academy of Finland and Business Finland have become the largest ones (Suomen Akatemia 2016). The profiles and missions of these funding institutions are, however, different, and as was noticed earlier, also with regard to their popularity among different research institutions. Kari Immonen (1995) has shed light on the early developments of Academy of Finland through various documents. The "old" Academy of Finland was founded in 1949 with the aim of distancing science from the government and subsequently securing scientific freedom and purity. The conception changed coming to 1970s when the "new" Academy of Finland was founded as a criticism to the old model, highlighting the need to see science as part of social policy and servant of societal development, not something of which development scientists can alone decide on. (Immonen 1995, 19-21.) Academy of Finland has become a significant actor in the area of Finnish academic research and science-policy. Overall it has focused on research counselling, supporting the enhancement of research infrastructure and research led by investigators (OECD 2017, 35).

Innovation policy emphasis has also been visible in the Academy of Finland's search for units of excellence, with the aim of securing the competitive position of Finland in relation to international science funding. (Immonen 1995, 313.) Additionally, Academy of Finland has in recent years taken up new roles and tasks, for instance by organizing funding through profiling and thus aiming at adjusting higher education structures. In addition, prior to founding the Strategic Research Council, Academy of Finland was cooperating with Tekes in the funding of SHOK-programmes between the years of 2008-2015. They were created to enhance collaboration between science and industry in order "to enable more radical innovation and to encourage academia to carry out research and PhD education in industrially relevant areas". It has been argued afterwards, that companies ended up ruling out the other actors' approaches and perspectives in the cooperation. It resulted in the cooperation being rather superficial and short-term in length. (OECD 2017, 35.)

Tekes was founded in 1983, adopting the funding tasks of Sitra, the Finnish Innovation Fund, at the time. It has become a significant actor in funding particularly projects around research and development (R & D). (Hautamäki & Ståhle 2012, 60.) Very recently Tekes has undergone structural changes as it was re-named after its renewal in 2018, becoming Business Finland. Through the renewal it merged with Finpro, an organization that focuses on promoting Finnish trade. (ScienceBusiness Network News 2018; Business Finland 2018.) In Business Finland's (2018) current strategy it is stated that they "enable companies to grow internationally and also create world-class business ecosystems and a competitive business environment for Finland". The strategy indicates a focus on growth through helping companies broaden their functions and become international as well as by funding research and innovations.

When looking at the share of funding delegated to these funding organizations in the past ten years, quite visible changes have occurred. Changes in Business Finland's funding have in particular been enormous due to the recent extensive governmental saving cuts. Business Finland's funding has decreased steadily since 2010. It used to have almost two times higher funding in comparison to Academy of Finland but the difference has now stabilized. According to the statistics of 2018, Academy of Finland has a bigger amount of funding (444.1 million) in comparison to (391.3 million) Business Finland. (SVT 2018.)

According to Finland's OECD report from the year of 2017, "the development of public research funding in Finland has, in relative terms, moved away from the earlier pattern of focusing on applied research and technology through Tekes towards more basic research which is mostly conducted at universities" (OECD 2017, 35). Report argues the development to be controversial when the aim is to further the development of new technologies, the more applied research work and their connection to creating innovations and solving challenges to "combat Finland's recent decline in competitiveness, exports and productivity and to set Finland back on a sustainable growth trajectory" (ibid., 35-36).

However, even though Academy of Finland's funding has increased, it has happened mainly through strategically targeted, top-down programmes through which certain areas of importance and impact are assigned externally. Its law was modified (Finlex 2014) through the renewal of state research institutes and research funding that the government of Finland put forward in 2013, having been implemented in the year of 2015. The reform has affected the share of funding between organizations. Through the renewal, structural changes were made between state research institutes, universities and other institutions. State research institutes were brought closer together and as part of universities, the cooperation of institutes and higher education were tightened, and the interconnections of institutions were developed. When it comes to research funding, three main changes were implemented: 1) the funding instrument Strategic Research Council (SRC) was founded, 2) evaluation, research and reporting supporting the decision- making of government was enhanced, and 3) research funding was collected in ministries in the form of the so called "TEAS-projects". (VNK 2013; Late & Puuska 2014, 182-183; OECD 2017, 36.)

The aim of the renewal is to have more research base in the preparation, decision- making and implementation of social policy. Furthermore, in the renewal, research is spoken of as "a strategic resource for the development of society" and a way to broaden the knowledge base for decision-making enhancing its quality and reliability. And in particular, the aim is to pay attention to supporting the governmental bodies and ministries in their work. (VNK 2013.) Overall, 65 million euros of the government's core funds were transferred to the new structures that were formed through the renewal: 12,5 million to the TEAS-projects and 52,5 million to SRC instrument (of which almost 1/3 from

VTT). Funding of strategic research is competitive and is allocated from different directions of funding. In 2015–2017 the funding was withdrawn from the research budget of government R & D institutes (52,5 million), from the Academy of Finland's program based funding (7,5 million) and from Business Finland's innovation and research funding (10 million). In 2017, a total amount of 70 million was directed for the funding instrument. (VNK 2013, 9; OECD 2017, 36.)

It can be assumed that these structural changes will affect, in particular, the working environment of state research institutes in a profound way and may require fundamental changes in order to manage the cuts and the competitive funding that state research institutes have to increasingly rely on. The renewal of state research institutes has provoked considerable discussion and concern about the future of stable research infrastructure, its ability to function in the same way as before and hold permanent work positions. (Late & Puuska 184; VNK 2013.) This situation makes hearing researchers from different institutional backgrounds in new collaborations particularly interesting and important since as it was noticed in this chapter, there may also be differences in their research orientations and ways of working.

2.3 Strategic Research Council

Academy of Finland's Strategic Research Council can be seen as a newcomer in the Finnish research funding field. The main goals of the funding instrument particularly highlight a need for transdisciplinary interaction between actors of different sectors and cross-disciplinary interaction between academics from various backgrounds. The objective is, through highly qualified science and interaction, to create solutions to societal challenges and to produce evidence-based research for informed decision-making. (Mickwitz & Maijala 2015, 29-33; Suomen Akatemia 2018.)

Consequently, in SRC funded strategic research programmes, interaction is, in particular, highlighted as a means for achieving societal impact of science. In order to enhance interaction, the programme has several requirements for its participants. Consortia that are eligible to apply for funding have to consist of minimum two different organizations, minimum three or more research groups and come from minimum three different disciplines. Consortia create an interaction plan that includes interaction partners and stakeholders relevant to their project. When it comes to the assessment of the SRC

projects, in addition to the traditional scientific peer review, the SRC programme also includes a societal peer review. Including a separate societal peer review is something completely new in the Academy of Finland's impact assessment. (Mickwitz & Maijala 2015, 29-33; Suomen Akatemia 2018.) Hence, in the SRC programme, there are quantitative indicators such as social media usage for societal and scientific impact (Appendix 2) to report on as well as qualitative societal and economic impact narratives (Appendix 3) through which researchers can more freely describe their project's impact.

SRC makes a proposal for research themes annually for the government that then defines the need for research. SRC consists of academic professionals from different fields who interact with stakeholders in the first phase of identifying potential research themes. Open consultation takes place on the proposed research themes and the comments based on the consultation are taken into account as SRC assigns the research theme proposals for the government. The government decides on the proposed research themes and then announces them back to SRC. The themes chosen by the government are formed into programmes by SRC. SRC co-operates with Strategic Research Unit in the Academy of Finland and designs the research programmes based on the assigned themes. The programmes are 3-6 years in length. (Suomen Akatemia 2018.)

3. Theoretical approach and previous research

In this section, I look into previous research literature on science policy changes at the level of local practices, experiences and perceptions. Previous literature relevant to the thesis has studied new programmes, science policy concepts and schemes, potential knowledge production changes, changing work realities, tasks and roles as well as engagement dynamics between collaborating scientists and partners. In the analysis of the data I will reflect on the findings of this literature. In addition, I present the concept of boundary object (Star & Griesemer 1989) and articulation work (Star & Strauss 1999, Strauss 1985) among their neighbouring concepts that I will utilize as analytical tools in construing my findings.

3.1 Previous research on science policy changes in local contexts

Although there is a broad variety of theoretical literature on the overall science policy and knowledge production changes, there remains a fairly small amount of empirical research on these changes at the level of scientists' experiences, research practices and work realities. (Maasen et al. 2006, 394; Felt et al. 2013, 512; Felt et al. 2016, 734; Möllers 2017, 16.) It is, hence, often by the authors stated that there remains a gap to fill in for studying these kinds of new programmes in order to understand the potential changes in research practices and environment. The macro-level conceptualizations of changes often highlight inter- and transdisciplinary research as visible characteristics of the knowledge production, especially regarding issues of environment and health (Maasen et al. 2006, 394; Felt et. al 2013, 512). Of these two characteristics Maasen and colleagues state that interdisciplinarity has been under more investigation (2006, 394). Transdisciplinarity itself is used in various discourses in different ways. For example, Osborne explains that Mode 2- knowledge production includes transdisciplinarity as one of its characteristics while it may on the other hand also relate to research methodology (2015, 9-11).

The societal interaction in the SRC projects has been studied in a case study within research project: "Public Engagement Innovations for Horizon 2020" (PE2020) in collaboration with the Strategic Research Council. Timo Aarrevaara and Kirsi Pulkkinen (2016) analyzed SRC consortia's 13 interaction plans and held discussions with the project leaders and interaction coordinators after six months of starting the project. They found interaction to be a very inherent and dynamic part of the whole process. Moreover, something that is not a separate task but "rather a cross-cutting working method" that researchers also increasingly learn in the programme. They found that "the role of researchers in societal interaction is much more complex and multi-faceted than could be expected" because in addition to research they actively participate in facilitative and cooperative tasks with the different participants involved. They were seen to partake in public engagement practices beyond one-way communication and external help. (Aarrevaara & Pulkkinen 2016, 12-13.) These findings make it interesting to hear researchers themselves on the perceived changes regarding their daily work. I did not find any previous studies on researchers' experiences of SRC programme or other new research programmes and schemes in Finland.

New collaborative programmes, organizations, funding schemes as well as interdisciplinary projects that emphasize solution-oriented, collaborative research with certain pre-assigned aims have been studied in some other countries. Previous research has shed light, for instance, on "boundary organizations" (e.g. Parker & Crona 2012; see also Guston 2001), "transdisciplinary sustainability research" (Felt et al. 2016) and "team science" (DeHart 2017).

Several authors (e.g. Felt 2016; Parker & Crona 2012; Wehrens et al. 2013; Möllers 2017) have found that overall participating in new funding schemes and programmes might be "a fluid process of managing multiple sets of tensions" (Parker & Crona 2012, 282) rather than something that simply stabilizes them. These institutional and individual tensions have derived from in particular the attempts of combining diverging rationalities and the needs of participating organizations and stakeholders. Rik Wehrens, Marleen Bekker and Roland Bal (2014) studied four Dutch collaborative research projects and shed light on the strategies participants may use when managing the collaboration. They observed that participants were involved in a challenging process through which they simultaneously aimed at maintaining and coordinating both the relationships and the differing accountability expectations of the projects. John Parker and Beatrice Crona (2012) also found this kind of constant negotiation and balancing in between different commitments through studying tensions present in university-based boundary organizations. These tensions happened especially between the aims of basic and applied research, interdisciplinarity and disciplinarity, real-time and long-term knowledge production as well as consultancy and autonomy. Their data consisted of participant interviews and various documents relevant to the case. (Parker & Crona 2012, 282.)

Ulrike Felt and colleagues (2016) found in their research on transdisciplinary sustainability research project three science-society models representing different types of engagement between scientists and societal actors. Participants often used them strategically depending on the argument at hand. The aims of closer engagement resulted in different kinds of tensions. These related to, for instance, the co-existence of the collective knowledge production's resource-demanding nature and the more traditional academic values with disciplinary divisions. As a result, the relationships between participants often stayed temporary without a lasting engagement. Academic achievements preserving scientists' position were prioritized ahead of the output outside of the academia. Felt and colleagues (2013) found gaps in interaction also when they

studied the adaptation of researchers beginning their career into transdisciplinary research. Although their informants aimed at including the ideals of collaborative research into their work, transdisciplinary interaction often remained quite ambiguous in definition. Accordingly, it either did not actually exist or lacked adequate practical tools and facilitation. Tensions were also stemming from differences between the new funding schemes' and academic communities' institutional requirements and credibility systems, which has also been found in other studies on the approaches (e.g. Thompson et al. 2017; DeHart 2017).

In addition, at the individual level tensions within collaborations have, for example, derived from the aims of combining diverging scientific perspectives and epistemic commitments (e.g. Wehrens et al. 2013; Brister 2016), incompatible expectations and insufficient facilitative support (Felt et al. 2013), dissimilar publication preferences as well as diverging world views and distrust (Thompson et al. 2017; DeHart 2017). On the other hand, it has also been found that collaboration under new framings may motivate and empower participants, increasing feelings of self-efficacy regarding participation in inclusive problem-solving and societal change (Thompson et al 2017; Rask 2018). In addition, participants have perceived their understanding of phenomena to increase, and their publication dissemination to become more diverse and impactful through new collaborations (DeHart 2017, 461).

Outside the new programmes and schemes, several empirical studies (e.g. Tuunainen 2005; Tuunainen & Knuuttila 2009; Hakala & Ylijoki 2001) have observed that diagnoses of changes in knowledge production (e.g. Nowotny 2003; Gibbons et al. 1994) might not overall be as profound and linear as has been suggested. Juha Tuunainen and Tarja Knuuttila state that even though there is research on the deepening relations of university and industry, much of it has been conducted with "cross-sectional quantitative data" or "broad paintbrushes to portray the changed landscape, often with a normative overtone" (Tuunainen & Knuuttila 2009, 688). They investigated the attempts of two different research groups in combining academic and business objectives in their work in the University of Helsinki. Through their study, they found that these activities differed in their requirements and suggested new roles for the participants. New requirements were often incompatible, creating role conflicts (see also Tuunainen 2005; Boardman & Bozeman 2007). Different activities did not simply hybridize in practice but resulted in the maintenance of the more traditional boundaries. Boundaries were visible regarding attempts of commercialization especially due to a variety of organizational regulations

since “most universities are either public sector entities or tax-exempt organizations”. (Tuunainen & Knuuttila 2009, 689.) Juha Tuunainen (2005) observed similar kinds of tensions in the case of another university based research group that aimed at combining business objectives into their work. These tensions stemmed from issues regarding intellectual property rights, university’s research materials and equipment, teaching responsibilities and diverging bureaucratic accountabilities. In the end, the work was separated socially in terms of roles as well as physically in terms of workspaces. (Tuunainen 2005.)

It has also been suggested (Knuuttila & Tuunainen 2009; Hakala & Ylijoki 2001; Smith 2012) that due to the diversity of science’s relevance and internal heterogeneity it is quite difficult to categorize research as either Mode 1 or Mode 2 knowledge production (Gibbons et al. 1994). Science may be seen to have its own “epistemic cultures” (Knorr Cetina 1999) or “academic tribes” (Becher & Trowler 2001). Accordingly, there are different ways of working and thinking in science (Knorr Cetina & Reichmann 2015, 873) even within one field of research. Through studying three different units within academia in the Finnish context, Johanna Hakala and Oili-Helena Ylijoki suggest that one cannot simply talk about “new mode of knowledge production in the singular form” (2001, 378). Through interviews of senior researchers, they found differential research orientations: academic, civil society as well as state- governmental and entrepreneurial. These orientations may overlap and co-exist within one unit even if one of them is more dominantly present. Differences between orientations caused conflicts, for instance, in relation to different audiences of research and publication preferences. Tensions also occurred when the academic and entrepreneurial orientations were to be combined. These tensions emerged from different time-spans for research and the need to either secure research results (entrepreneurial interest) or open them up (academic interest). As a result, many researchers were under increasing time-pressure as they had to balance between their own academic work and other additional projects, not seen as relevant to them. The more traditional academic values, norms and conventions sustained even though there were pressures to alter them. (Hakala & Ylijoki 2001.)

Demarcations between boundaries may this way come across more visibly when boundaries become threathened, for example, by external demands and diverging commitments. Thomas F. Gieryn (1983) calls this demarcation of boundaries “boundary work”. Scientists tend to separate science from non- science through boundary work to

gain intellectual authority, resources or in order to protect the autonomy of science. These boundaries regarding science are flexible and change within different historical contexts and times. Epistemic authority is a central concept in this analysis. (Gieryn 1983; Kiikeri & Ylikoski 2011, 96-97; Gieryn & Oberlin 2015, 266.) It relates to "the legitimate power to define, describe and explain bounded domains of reality" (Gieryn 1999, 1).

Balancing in between commitments and scientific work has been found in several other studies (e.g. Aarrevaara & Dobson 2015; Pietilä 2018; Hakala 2009) as well. These studies have shed light on science policy and higher education changes' effects on academic's profession, identity as well as working realities within Finnish universities. They have shown that university researchers face an increasing amount of different kinds of pressures. For example, these relate to aims of combining various demands external to their research work (e.g. communication, coordination, rapporting work, lecturing) having to decide on which work to grant more time. In addition, pressures are a consequence of an increasing efficiency demand regarding publications, competition over funding and insecurity regarding work contracts. Despite pressures, the level of satisfaction for the actual research work has in general been found to be high among academics (Aarrevaara & Dobson 2015, 221; Hakala 2009, 187). Inherent motivation may not, however, always be enough if one has to be under a constant insecurity regarding career continuation.

In order to respond to changing science policy needs scientists may also need to do extra work in order to fit their research under different framings. Norma Möllers (2017) and Jane Calvert (2006) have argued that this does not necessarily mean that the content of research would change radically. Scientists may be able to creatively adapt their research according to changing funding conditions. Jane Calvert (2006) showed that the concept of basic research was by scientists and policymakers used for boundary work to defend various interests and purposes. Due to the flexibility of the concept, scientists were able to "tailor" their work to seem more applied when it was demanded without changing the content of their research. Norma Möllers (2017) in a similar way found that scientists managed to use creativity under the framings of the new security programme. Even though they were able to do it, for some of the participants tailoring scientific problems however resulted in more conflicts and "articulation work" (Star & Strauss 1999) than others. In any case, researchers had to put much effort when answering to different demands pulling to diverse directions. This in turn may likely have an effect on their work

on different levels. (Möllers 2017, 15, 28.) Crona and Parker (2012) on the contrary found that researchers may not have as much flexibility in directing their research and thus move to stakeholders' direction more strongly in collaboration.

Vagueness of science policy concepts and buzzwords (e.g. Vincent 2014; Cairns & Krzywoszynska 2016; Miettinen 2002) such as basic research may hence make them functional within dissimilar contexts and usage. Reijo Miettinen (2002) studied the concept of National Innovation System (NIS) empirically and found that through its vagueness as well as credibility regarding various social spheres, it managed to gain its foundational position among diverse communities. This may be something more common to concepts that Miettinen calls "transdiscursive terms". These terms are used between policy and research and they share similar kinds of functions that make them powerful in usage. In spite of this, NIS among other science policy concepts tend to not take into account the contextual realities, which makes them limited in terms of policy-making. Miettinen concludes that "even if visionary concepts are efficient in organizing discussions of new issues, they do not provide the solutions in the form of policy measures". (Miettinen 2002, 149-150.)

It is also possible that the increasing assessment of societal impact within new programmes may not take into account the heterogeneousity of sciences and their forms of impact equally. Assessment may favor some research orientations at the expense of others, since the time-span and nature of societal impact may vary notably between different disciplines and academic orientations (e.g. Miettinen et al. 2015; Mustajoki 2017, 10-11; Koskinen 2016). Miettinen and colleagues (2015) also point out that in the discussion around societal impact the third mission of research is often seen as external to the aim of gaining more understanding of a phenomenon. Consequently, the work that enables a better understanding and ability to address and solve societal problems, "the epistemic mission of academic research", is problematically often not spoken in terms of societal impact (Miettinen et al. 2015, 258).

In addition to similarities, it hence seems important to pay attention to the potential differences among academics participating in new programmes and schemes. It has been found (e.g. Ylijoki & Ursin 2013, Smith 2012) that overall there is an increasing amount of polarization within academic communities. Science policy changes may affect academics differently, and thus be prone to pick winners and losers. Ylijoki and Ursin

(2013) found this through interviewing 42 academics in the Finnish context. Even though identities blurred between different narratives, polarization was apparent. For example, certain fields of research and positions played a part in creating these differences. Notable is that according to their results "the narratives of loss and success, and correspondingly the identity constructions as a loser and a winner, are mutually exclusive". (Ylijoki & Ursin 2013, 1147.) In the same way Smith (2012) found that the more policy-oriented researchers did not face as much dissatisfaction as the researchers who were not as closely related to the policy questions.

There is less research focusing on potential polarization among academics of dissimilar backgrounds and research orientations participating in new transdisciplinary programmes with common requirements. In the thesis, I hence study the ways in which the characteristics of SRC "work" among participants of dissimilar backgrounds. Moreover, the extent of tensions and comfort that participants express regarding their participation and subsequent adaptation in their everyday work will be studied. By focusing on participants' perspectives, I aim to shed light on strategic research in the changing research environment, in particular in Finland. Since there is still a relatively small amout of research on how scientists themselves perceive and manage the changes in a shared programme (Möllers 2017, 16; Felt et. al 2016, 734), I aim to participate in filling this gap in research.

3.2 Boundary object and articulation work

I use the concept of "boundary object" (Star & Griesemer 1989) and the concept of "articulation work"[4] (Star & Strauss 1999; Strauss 1985) among technical concepts of "community of practice", "memberships" and "naturalization" (Bowker & Star 1999) in construing my findings of strategic research. During the analysis, I observed that these conceptualizations could offer additional aspects and angles to the studied issue. In the thesis, they function as useful tools for organizing and analysing findings. They do not however offer a theory for analyzing the data, which suits the grounded theory methodology used in the thesis.

Boundary object has since its introduction been applied by diverse fields of research, for instance, in the form of text documents and, computer systems among others (e.g. Steger

[4] The concept of "articulation work" was originally developed by Anselm Strauss (1985).

2018; Huvila 2011). Susan Leigh Star and James R. Griesemer (1989) originally developed the concept of boundary object to shed light on how heterogeneous groups make sense of and manage cooperation without consensus. Through studying a "Berkeley's Museum of Vertebrate Zoology" they found that different communities of practice managed cooperation and subsequent issues of translation with the help of boundary objects. Even though participants gave dissimilar meanings to the objects, they were in their structure familiar enough for all of them. Participants were, hence, still able to preserve their identity and "informational requirements" (Bowker & Star 1999, 297) during collaboration since boundary objects are "weakly structured in common use and become strongly structured in individual-site use" (Bowker & Star 1999, 393).

Central characteristics of boundary objects are their "interpretive flexibility" that allows for the co-existence of multiple meanings, "the structure of informatic and work process needs and arrangements" as well as "dynamic between ill-structured and more tailored uses" (Star 2010, 601). Since the concept in itself is very adaptable to different contexts, Star (2010) has been asked, if nearly anything could function as one? Even when there is no one, distinguishably right way of using the concept, there are certain factors that distinguish an object from not being a boundary object. Star suggests that the organizational context and the practices and meanings of given communities are factors that make the object a boundary object, not merely the ambiguity that the object entails (Ibid, 612). The meaning-givings by the actors involved are this way evident in constructing and making the boundary object effective (Star & Griesemer 1989, 404). In the analysis, I will look at the meaning-givings of participants and their interaction with the physical qualities and characteristics of the programme. Materiality of an object emerges from the actions and work that participants practice for and with the object. It is thus not something by its mere structure (Star 2010, 603).

Boundary objects can be both conceptual and material. For example, through science and technology studies, it has been found that science policy concepts, due to their flexibility, can work as boundary objects. In this way, they may offer a commonly understandable conceptual framework to different actors involved, often between academics and policymakers (Flink and Kaldewey 2018, 14-15; Jacob 2005, 198). For example, Cara Steger and colleagues (2018) analyzed transdisciplinary collaboration within Ecosystem Services (ES), addressing them as boundary objects. They found that the ES framework

can potentially enhance interaction and build communication between different communities. In order for this to actualize, sustaining flexibility appeared to be important, particularly in the early phase and in discussion around concepts. (Steger et al. 2018, 159.)

The same issue was also noticed by Saarela and Rinne (2016) in their research on indicator application with regard to Ecosystem Services. They found that indicators could bring communities together for collaboration, enhancing mutual sharing of knowledge as well as usage of scientific knowledge in decision-making. At the same time indicators were prone to be affected by some views more than others. Hence, boundary objects are not necessarily neutral (Saarela & Rinne 2016, 57; Huvila 2011). Moreover, standardization should not be given the power ”to determine the boundary of a given problem”, rather embracing disciplinary takes relevant to the problem (Steger et al. 2018, 159). According to Bowker and Star (1999), it may be challenging to engineer or design boundary objects due to this kind of potential inflexibility that may arise with potentially imposing standards and categories. Inability to sustain the vagueness of objects may result in ignorance with regard to the heterogeneity of different communities of practice. (Bowker & Star 1999, 305-306.) Community of practice “is a unit of analysis that cuts across formal organizations, institutions like family and church, and other forms of association such as social movements” (ibid., 294).

I perceive that within the SRC programme there are participants coming from different communities of practice: for instance, disciplinary, organizational and occupational communities. Although they naturally overlap, in every community of practice there are series of conventions, categorizations, standards and rules that one eventually learns by acquiring a membership within a community of practice. Membership hence indicates to “increasing familiarity with the categories” (ibid., 294) that are used in a given community of practice. Usually one has several memberships through which “the experience of encountering objects and increasingly being in a naturalized relationship with them” is more likely (ibid., 294-95). Naturalization indicates to a process through which a certain category or object becomes less strange or unquestioned for a person, “stripping away the contingencies of an object's creation and its situated nature” (Bowker & Star 1999, 294-295).

I see the SRC programme as an engineered shared space that brings together different communities of practice with their own systems of naturalizations. By engineered I mean that the common requirements and rules of the programme partly shape the conditions for the collaboration. At the same time, however, the dynamics of the collaboration and subsequent end-results assumably vary based on what is "shared" in the space.

In aiming at seeing how participants manage their adaptation to this engineered shared space I, in addition to the concept of boundary object (Star & Griesemer 1989), also utilize the concept of articulation work (Star & Strauss 1999, 12-13; Strauss 1985). Articulation work is what happens when one aims to manage the tensions and meanings deriving from the co-existence of various memberships and naturalizations. This balancing work is invisible, and happens outside of the formal descriptions for work. (Bowker & Star 1999, 310; Star & Strauss 1999.) Paying attention to the invisible work participants practice in managing participation may also shed light on the feasibility of their adaptation to the engineered shared space.

4. Data and analysis methods

In this chapter, I will present the informants, method of interview and the interviewing situation. I will also present my approach to data, method of analysis and the way I utilized it in the analysis process.

4.1 Interview method and data

The empirical data of this study consists of 15 semi-structured interviews with 15 individual researchers who joined the SRC programme when it first started in 2015. The interviews were all recorded and transcribed into a written format, consisting of 230 pages of text in total. The interviews were collected during the fall of 2017 in November and December. I aimed at gathering a multi-faceted group of informants of dissimilar career phases, positions and academic backgrounds. In spite of this, the informants still form a homogenous group in the sense that they all share the same length of experience in participating in the particular programme as academic participants, and not for instance as science policy experts or stakeholders. The data sample includes researchers with different backgrounds regarding project funding, organization and field of research. The

geographical location of informants also varied, since they did not all live in the same city.

Political and economic sciences	1
Social sciences and humanities	3
Education sciences	1
Engineering, industrial engineering and management	2
Agriculture and forestry	1
Biology	2
Technology and applied mathematics	1
Organizational and environmental economics, economics science	2
Information sciences	1
Environmental sciences	1

Figure 1. Disciplinary backgrounds of informants

PhD students	3
Post-doctoral researchers (1-5 years of experience in the profession after graduating with PhD)	5
Senior researchers (over 10 years of experience in the profession)	3
Professors *	4

Figure 2. Career phases of informants

** Two of the professors are consortium leaders and two are part-time consortium leaders. One of the professors is also responsible of the consortia's interaction management.*

The organization and previous research funding backgrounds varied among the informants. Three professors and one senior researcher had mainly worked in state

research institutes with experience of different funders (EU, Tekes and some Academy of Finland-funding) with some experience of working in university. Two senior researchers and one professor had gained their main working experience from universities with Academy of Finland funding, one also with some Tekes-funding experience. PhD students and post-doc researchers had gained experience from working in state research institutes and/or universities. Among the early-stage researchers funding sources were EU, Tekes, SHOK, Academy of Finland and some smaller funders.

Among my informants, it was common that SRC was an additional project among other on-going projects. For a couple of informants it was the only project they were working in and their funding came solely from SRC. For many of the informants funding came also from other sources such as universities. It was common especially for the more experienced researchers to have many projects in addition to the SRC programme. For example, one team leader did not earn personal salary from the SRC programme. The team leader's salary hence came solely from university work, and the project funding was delegated to the research group. The delegation of responsibilities varied among my informants: consortium leaders, for instance, usually took care of the planning, coordinating and governing of the consortium while for instance PhD's were writing their dissertations as part of the programme.

As a method of interview, I used thematic semi-structured interview in which the questions and themes are defined prior to the interview. The organization of questions is however looser than in structured interviews. This enables informants to discuss themes more freely and leaves space for interpretations. (Eskola & Suoranta 2000, 86.) I used a question list in all of the interviews and aimed at including the questions in same way throughout the discussion. It was not always necessary to ask all the planned questions since some of them were covered in the discussions naturally. Some interviews progressed more naturally while others were more question-led. I chose to interview informants individually so that the experiences could be discussed without potential pressure to answer in a certain way, a situation that might come up in a group discussion. On the other hand, group discussions could also offer very interesting material for analysis. For the purpose of this thesis I, however, anticipated that I could receive more in-depth information individually with informants.

4.2 The recruitment of informants and interview situation

I found informants' contact information either from SRC project pages, consortias' contact list or by Google search that directed me to researchers' organizational page or some other publicly available web page. In the end it was relatively easy to find people's contact information and gather a group of participants with different disciplinary and organizational backgrounds. It was a delightful surprise that recruiting informants was a considerably fast and smooth process, even though there were a few researchers who did not reply to the invitation. It was also motivating that informants were interested in the subject area of the study. Some of them also asked to receive the completed thesis.

The factors that have been found to increase informants' will to participate are, for instance, subject of research being very close and familiar but not specifically sensitive to informants (Kuula 2011, 159). I think this may be the case with the subject of this thesis, too. I assume that it is quite a neutral subject matter but at the same time important since it focuses on informants' work conditions and rationalities. In the emails, I briefly presented myself, the subject of the thesis and the general questions and themes I was interested in hearing about from informants. I also explained that the interview data would be anonymized so that informants cannot be recognized. Some of the interviews were held in rooms of Kaisa library and learning centre Alexandria which I reserved for private use. In addition, I interviewed informants at their work places' private rooms, and three of the interviews were also held on Skype. All of the interviews were in Finnish. Before starting the interview, I again briefly described the purpose of the data collection and asked whether recording the interview and using it in the thesis was ok. Interviews lasted from approximately 45 minutes to two hours. Majority of the interviews lasted for around one hour. I recorded all of the interviews with Consumer Research Centre's recorder. All the interviews have now been removed from the recorder.

According to Ilkka Pietilä (2010, 414) it is important that a researcher considers one's own position and role in relation to the informants before going into the interview situation. It is also vital to analyze how informants might position the interviewer, for example, who and what he or she is representive of. There is always an element of comparison and audience present in interview situations. (Pietilä 2010, 414- 416.) Prior, during and after the interviews I thought about the way I might be positioned. As a master's student and research intern I may have been a quite easily approachable

interviewer in comparison to someone else who would have had a more influential position regarding the informants' work. I also believe it may have been relatively easy to discuss the topics in a relaxed way since I am not a person the informants would see every day in their working environment. At the same time, I was well aware of the requirements and characteristics of the SRC programme in general. Hence, I was able to understand and discuss the issues without difficulties in understanding the nature of the new programme. Interview questions are presented in Appendix 1.

4.3 Ethical considerations

In addition to informed consent, anonymization or, in other words, diminishing the recognizability of informants is one of the main ethical norms within human sciences. This is, however, not necessary in all research. As an example, research focusing on historical events often includes more specific details or names. (Kuula 2011, 201.) It could have been possible to include names in this thesis if informants would have preferred to have them included. I, however, from the beginning decided that I would rather anonymize the answers to prevent any potential harm for the informants. One may also this way increase reliability since there is perhaps more room for informants to express themselves freely. Some of the informants also asked me to hide specific details that might enable recognition.

Overall, the 16 consortia that started in 2015 include a vast amount of researchers at different phases of their career. The consortia are overall very large in size (Suomen Akatemia 2018), which makes the anonymization of informants from the same programme relatively easy. In spite of this, anonymization took me much consideration and work. I had to make well-thought adjustments in order to secure it sufficiently. Discussions included many context-specific details, which could enable recognition if shown in their original transcribed format. From the data extracts that are used in the thesis, I removed all the specific details, for example, on informants' subject of research, consortia's name or background information. Therefore, I only describe their background in terms of main funding source experience (e.g. Tekes, Academy of Finland, EU and SHOK), main organizational experience (universities, state research institutes) or field and type of research in cases where it is relevant to mention. I acknowledge that due to this, some parts of the analysis are missing specific contextual details that could make the analysis even more elaborated and precise with detailed descriptions.

In spite of anonymization of specific details, I have aimed at sustaining all the relevant information regarding analyzed data. I refer to informants with their career phase: PhD students, post-doc researchers, senior researchers and professors. Among the informants there were eight females and seven males. I have excluded gender details from the extracts in analysis in order to enhance anonymity. In this thesis, based on my data sample, I do not consider gender as a factor that could add significant extra-value to the analysis and results. When it comes to scientific disciplines, I describe them in a general manner using categories by disciplines. In some cases where it is relevant I simultaneously combine different general background factors. When I refer to consortia leaders or other specific roles, I do not simultaneously discuss any other specific details of these informants' disciplines or backgrounds. Furthermore, I do not discuss personal histories in a way that would make the person recognizable. In addition, I do not specify which consortia I selected and included in my data sample. As the informants started the programme in 2015 (first phase) it indicates that they already have experience of the programme and can hence discuss their perceptions and experiences beyond assumptions.

Since I previously worked in the Strategic Research Unit as an intern, I also thought about the potential ethical aspects regarding my prior knowledge of the programme. I do not use any of the material or information I learned during the internship. I only utilize the data from the interviews and information that is publicly available from web pages.

4.4 Method and process of analysis

In qualitative analysis researcher aims to create a condensed description of the phenomenon at hand and further connect the results to a larger context around the phenomenon with previous research results and discussion. In practice, this usually means observing the data, for instance transcribed audio data, texts or photographs, by dividing and condensing it. (Tuomi & Sarajärvi 2002, 105.) There are various ways of conducting qualitative content analysis. In this thesis, I used a grounded theory approach (Glaser & Strauss 2006) as a method of analysis. Grounded theory is a research method originally developed by Barney Glaser and Anselm Strauss in the 1960s as a critique to very abstract, all-encompassing "grand theories" in social sciences (Luomanen 2010, 351). Glaser and Strauss call grounded theory as "the discovery of theory from data" (2006, 2) meaning that the aim is to systematically take into account local, situational and contextual factors by focusing on a more data-driven approach. The idea is to find the

categories and codes from the data without having too preconceived ideas about what one is looking for. This means that there is no particular theory to be used or to be verified prior starting the analysis. Hypotheses are instead formed, tested and re-formed throughout the analysis process. (Luomanen 2010, 354.) However, even though the codes and categories are derived from the data it is likely never possible to look at the data completely free of prior conceptions or theoretical knowledge of the phenomenon (Eskola & Suoranta 2000, 186). I assume that the theoretical literature I have read has played a role in what I found from the data even when I did not use any theory in particular. In the analysis, I connect my findings to the previous theoretical literature.

The qualitative data of the thesis consists of researchers' interviews: their ways of talking and giving meanings to strategic research. Interviews were, hence, my material for studying the phenomenon of strategic research. Anssi Peräkylä (2011) states that "by using interviews, the researcher can reach areas of reality that would otherwise remain inaccessible such as people's subjective experiences and attitudes" as well as take into account past, present and future events (2011, 869). When the number of informants is relatively small, it is relevant to focus on the meanings that informants give and the differences and similarities among them. Moreover, it can be analysed what the differences and similarities in explaining the experiences may tell about, for instance, the participant's role in society. (Ruusuvuori et al. 2010, 17.) In the case of my thesis, I look at what the differences and similarities in informants' perceptions and experiences may tell about strategic research. Mika Kiikeri and Petri Ylikoski (2011) explain that when studying science one does not need to take a philosophical stance in opposition to another. One should, however, aim at explaining all the views and perspectives that are presented, without dismissing or judging them as irrational or untruthful. Therefore, it is important to adapt an observer's perspective to the things that the participants say, how they form their beliefs and the criteria they use for evaluating their beliefs. Evaluating the rightness or wrongness of the views and descriptions is therefore not feasible – instead, understanding the construction processes of the beliefs is what a researcher of science aims to do. (Kiikeri & Ylikoski 2011, 26-27.) In aiming at understanding the construction processes of the beliefs and perceptions I naturally could not take into account all the aspects that might play a part in creating these differences. I looked at the meaning-giving as part of a larger theoretical context and previous literature around the issue.

Analysis, coding and interpretation of data are all separate, but closely interconnected phases that a researcher faces during the research process. Especially in qualitative research, the collection, handling and analysis of the data tend to intertwine and overlap already from the very beginning of research. (Ruusuvuori et al. 2010, 11.) During the collection of data, after every interview I made general observations and wrote notes. After the interviews were collected, they were transcribed word-to-word. I first used Atlas.ti- program for coding and categorizing the data. At this initial phase I focused on how researchers spoke about their motivations, desires, restrictions, capabilities, obligations and valuations in relation to different conditions and backgrounds present in their reflections with regard to SRC programme This first phase of content analysis helped in thematizing the data and finding broader categories of things and themes. I see this as the open coding phase of grounded theory where relevant phenomenon are assigned as categories.

After this phase, I felt that it would be useful to read the interviews again to test the intitial themes and findings. Thematizing can further help to conceptualize the research problem that is arising from the data. This does not, however, lead to a final analysis by itself but requires dialogue between theory and empirical data. (Eskola & Suoranta 2000, 175.) Within content analysis it is, furthermore, recommended to move towards a more specific description that goes beyond raw classification and categorization (Ruusuvuori et al. 2010, 19). The aim in content analysis is to construct a more conceptual view of the phenomenon that is eventually formed on the basis of organized, condensed and re-organized empirical observations. (Tuomi & Saarijärvi 2002.) In order to conceptualize the phenomenon, I started adding the answers one by one under different interview questions in Word, aiming at elaborating the themes I found using Atlas.ti. I wrote several mind maps, memos and notes throughout the analysis process. I also attached more general categories to more specific categories and re-named and tested them while writing the analysis. This kind of re-shaping and –naming of categories is common in grounded theory and usually continues throughout the whole process (Luomanen 2010, 360). During the analysis, I noticed that seeing what the similarities and differences in informants' experiences regarding SRC mean was the most interesting issue in the data.

I collected informants' experiences as extracts under different broad categories into Excel files that were at first separated by career phases, all including the same categories. This further strengthened the systemacy of the observations as Ruusuvuori and colleagues state

(2010, 19) that it is important to make sure that analysis is not based on mere impressions or conceptions that best help to describe or fulfill a certain category. The comprehensiveness of data inclines that the observations are not chosen in a scattered way (Eskola & Suoranta 2000, 215). Dividing the answers in Excel made it easier to compare the answers to see how often similar observations occurred and whether they were present in just a few of the interviews. Although questions on the minority or majority of interviewees' conceptions are usually more relevant in quantitative research than qualitative research, minor quantification of observations can help to situate them in relation to the whole data. This can help in addressing exceptions since differences and similarities are then easier to recognize. Pointing out exceptions can help in understanding and testing the other findings in data, and this way also increase the validity of research. (Ruusuvuori et al. 2010, 27-28.) I aimed to do this by showing the diversity of experiences and including exceptions that form the differences as an important part of the analysis. Through categorizing the observations, I also noticed that the concept of boundary object (Star & Griesemer 1989) and its neighbouring concepts as well as articulation work (Star & Strauss 1999, Strauss 1985) could offer tools in conceptualizing the observations and offer new angles to the analysis.

I further developed the analysis with the help of these conceptual tools. In grounded theory, the aim is to reach a saturation point where no new cases are no longer found within categories. This is in a way an impossible task as there are always things that one could analyze more and in even smaller detail. According to Glaser and Strauss (2006, 60-62) "the criteria for determining saturation, hence, are a combination of the empirical limits of the data, the integration and density of the theory, and the analyst's theoretical sensitivity." At some point of the analysis, I felt that a saturation point had been reached. I did not any longer find new parts of the data to be included in the assigned categories. The re-shaping of the analysis and interaction with theory, however, continued until finishing the writing. Eskola and Suoranta (2000) address that in order to gain and increase reliability in qualitative research, one needs to evaluate, question and open up the solutions that were made during the whole process of research. This means that qualitative research should include researcher's own thinking and briefings of different research phases. In addition to doing this, I explain the ways in which interpretations are formed. Showing extracts from the data can help the reader understand, as well as challenge the rules for interpretations and this way increase reliability. (Eskola & Suoranta 2000, 208- 216.)

5. Analysis

In the analysis, I study strategic research "at work" and aim to see how the informants interact with the programme's characteristics; what they enable and constrain regarding participants' work. SRC programme's requirements and rules assist in engineering a shared space for participants of diverse backgrounds. In this shared space, vague strategicness, diversified legitimation and organized inclusion appeared to be prominent characteristics. The analysis consists of four sections. In the section 5.1, I answer to the first research question and analyse the similarities among informants' adaptation to SRC. The similarities show that the characteristics of strategic research may enable it to function as a boundary object (Star & Griesemer1989) due to its flexibility in various situations. In the sections 5.2.-5.4, I answer to the second research question on whether there are differences in participants' adaptation to the programme, and if there are, where the differences derive from. In these three analysis sections, invisible articulation work (Star & Strauss 1999; Bowker & Star 1999) comes across most visibly. These sections show that the characteristics of strategic research may also concretize diverse ways among participants. Consequently, flexible characteristics may also take inflexible forms, and provoke tensions that participants have to manage themselves.

5.1 Flexible applicability

In this section, I will shed light on the similarities among my informants' adaptation to the programme. By using various examples from the data, I will show how the characteristics of strategic research make it flexible to several purposes and contexts of usage. Vague strategicness, diversified legitimation and organized inclusion enabled informants to defend dissimilar needs and activities, adapt their subject of research as part of the strategic research framing and communicate with people from various backgrounds.

5.1.1 Framing diverse research as strategic

In spite of government deciding about the overall themes for research within the SRC programme, there was a consensus among my informants in that they are able to study a subject matter they would in any case like to study. Most of my informants had been contacted to join the programme's consortia because their expertise and prior experience suited the themes they are focusing on within the programme. Consortium leaders and many of the senior researchers and professors had themselves been planning the project from the beginning. PhD students' dissertations were suitable to the theme of their SRC

project and, hence, they could include articles written within the programme into their dissertations. Their work tasks were at the same time determined through university. For PhD students SRC project hence was more of an additional project linked to their on-going PhD research. Subsequently the programme did not play a determining role in guiding their work but rather created opportunities regarding career development.

Informants' subject of research was adaptable to SRC programme's vague problem framing, and hence they did not need to alter it in any notable way. The programme's broad themes and problems enable the characteristic that I call vague strategicness. This resembles what Jane Calvert has suggested in relation to grand challenges: they may enable an accommodation of very diverse research approaches since the framings of challenges are very broad (2013, 475-476). She also found that through the concept of basic research scientists were able to tailor their work to appear more applied according to changing science policy framings (2006, 211). Vaguely determined research themes enabled my informants to tailor their subject of research as strategic quite easily. In contrast to Calvert's findings, my informants did not discuss making their research look more applied. They rather explained that they have a relatively strong agency in deciding on their approach within the abstract framing. Some had continued to work on exactly the same subject as they had been working on previously without the need to change the content of research in any way.

> "[--]….we had conducted a similar kind of intervention on a much smaller scale years back. And well, of course I was interested in it since it is exactly, researchwise this is in any case exactly what I would be interested in doing. So, due to that I was pleased to join. And then it is just, research funding is so scarce that of course one should participate if there is some feasible thing that one can carry out. And this is, this suited extremely well to my subject of research and absolutely, a similar sort of thing we had applied funding for consortia from Academy previously. But it did not work out that time. So we in a way, it was almost like, well basically on the same research question." (Senior researcher, Interview 5, Q1[5])

Many of the informants further explained that in order to secure this flexibility, having wide enough research themes is very important. According to them, strategic research themes and issues cannot be determined too strictly beforehand so that they may continue to apply the themes in their own way. They explained that it is in this way possible to use

[5] Original Finnish quotations can be found in Appendix 4.

one's creativity within an abstract frame, preserving the relative independence of their work. In other words, they may as an act of articulation work continue to tailor their work according to the changes in science policy requirements.

> "It is like…Unless that…I think for example that...Unless it will not go so that those projects…Basically the fact that we were first given, for example [overall theme of research] and then the aim was to study [mechanims of the research theme] so that it was not…the assignment was vague enough, one can suit many things within it. So, it is not strictly…if it would have been limited to promoting [a certain specific aspect] and merely enhancing [a certain limited aspect] or something in a very narrow sense. So, in that case it would have been exactly that, that for example now what is sought after is not what are [these] but rather how do we promote [these]. So that. Now it was given in a sufficiently vague manner so that researchers can really determine what we now want to study. And then I do not see that…Secondly, when the themes are determined they need to be broad enough. And on the other hand...So then I think there is no political steering in there, what is now sought after. From there one cannot read what kinds of things or results are actually wanted." (Professor, Interview 7, Q2)

With regard to my informants' subject of research, strategic research thus appeared to be "plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites" (Star & Griesemer 1989, 393). Regarding these perceptions, it seems that informants did not see radical changes in the nature of their own piece of research under the strategic framing even if there had overall been more interaction and impact emphasis. It seems that strategic vagueness allows for inclusion of memberships from different communities of practice (Bowker & Star 1999). Research approaches from natural to social sciences may be locally tailored under the framing. This also resembles what Miettinen (2002, 137) calls the "epistemic organizing function" of "transdiscursive terms" such as the National Innovation System. Epistemic organizing function enables the inclusion of diverse backgrounds by organizing different issues under a wide framing. He found that this among other five functions make these terms particularly effective. In relation to the concept of boundary object (Star & Griesemer 1989) I perceive Miettinen's concept more elaborated with detailed descriptions of the different functions. All of the functions can interestingly be found also in strategic research. They did however not actualize in the experiences of all the informants, for example, as was the case with "the empowering function" (Miettinen 2002, 140) which will be discussed later in the analysis.

The possibility to fit one's subject of research under the programme framing might not however be as easy for everyone even though all of my informants were able to do it with relative ease. One of the interviewed senior researchers furthermore explained that personally it had not been a problem since their small research group has their own, interesting approach to the overall strategic problem. However, the fulfillment of professional motivations regarding substance of research had according to the senior researcher not been self-evident for others from the same academic community of practice. Senior researcher explained this by the experiences of colleagues from social sciences and humanities' backgrounds in other research groups within the programme. They had faced controversy due to the un-interesting composition of the research within their own research group. It is hence possible that not everyone is able to fit their subject of research under the framing if, for instance, their own research group is not investigating the subject in a way that suits everyone's interests. It is important to note that these voices were not included in my data. In terms of transdisciplinary interaction, many of the informants in spite of academic orientation explained that they had interacted with actors outside of academia already prior to the SRC programme.

> "And indeed, I would in a way compare it, that nevertheless, to medical research. That it is not…If some medicine is being tested, medicine company is also involved in there. Doctors will not themselves make the tablets in a mortar. So this is perhaps kind of a same thing in that way." (Senior Researcher, Interview 5, Q3)

It is, however, notable that even among my interviewees, for those coming from a more "applied research" background it might be in particular very easy to adapt their subject as part of the vague framing without the need to make it seem more applied. On the contrary, for example, a senior researcher from humanities background explained more upfront that without a stable work contract one needs to be able to function under different research agendas, even when they are not fully in line with the quality or critical aspects one would want to aim for. The amount of articulation work participants need to practice in terms of tailoring their scientific approach may differ among participants. Norma Möllers (2017, 15) found in her research that "the more work researchers had to put into adjusting their scientific problems to conflicting demands over the course of their project, the more problematic was their experience of the government's demands". Even though all of my informants were in contrast able to accommodate their own subject of research as part of the overall framing with relative ease, some of them experienced profound mismatches in integrating their own scientific approach as part of collective collaboration.

These issues will be discussed in sections focusing on the differences in adaptation to the programme.

5.1.2 Justification for various aspects

By looking at the similarities among informants' perceptions I found that SRC legitimates different things within its vague framing and multiple requirements, leaving space for various interpretations. This characteristic that I call diversified legitimation resembles the "ill-structured side" that is a common feature of boundary objects. It enables participants to justify different needs, interests and activities (Star 2010, 613).

For example, many of my informants explained that the coordinator of the programme, Academy of Finland, has a strong status as a funder of academic research. Sustaining the aims of high quality science are still strongly emphasized in the programme, offering legitimacy for fulfilling the commitments of their academic community of practice (Bowker & Star 1999). These being the conventions, norms and rules of the academic community embedded in the programme's physical structure. Often interviewees subsequently explained that in addition to solving the more practical problems, the aim of providing high quality academic papers that go through scientific peer review is still emphasized. Hence, informants often highlighted that the independence of their scientific conduct and credibility are still secured in spite of research being strategic. The programme's characteristics hence enabled participants to use strategic research for boundary work (Gieryn 1983) in separating their scientific work as not being interfered by external demands. One researcher with prior experience in a SHOK project perceived that it is very easy to adapt to the SRC project since the operational model is pretty much the same in both of the projects. According to the researcher, the longevity and stong academic orientation of the SRC programme however separates it from a consultancy project. This was not according to the researcher always the case in the SHOK projects. The inclusion of traditional scientific criteria and rules is according to Miettinen (2002, 137) "the epistemic function" of transdiscursive terms, which enhances the scientific credibility of a given concept.

Many of the informants also pointed out the weak research funding conditions as they explained that they are overall satisfied to gain funding and conduct research for a longer time on one theme. Length of a research programme (5 years) motivates since work contracts and research projects can generally be short-termed and insecure. Many

informants highlighted the importance of longevity in funding even though sudden funding cuts within the programme were a big disappointment for many of them. Applying every year for a new project is stressful and takes a lot of time away from research. Especially younger researchers starting their careers often stated that what they long for in the future career is some sort of stability and security.

> ”This SRC project is of course in that way tempting that it enables the kind of little more long-term work on a certain theme. We surely know that in university world short work contracts are very common, and in our project it has been positive that work contracts are aimed at lasting a little longer.” (Post-doc researcher, Interview 13, Q4)

The insecurity related to work trajectories is not a rare trait in Finnish university system as was found also in Oili Helena Ylijoki’s and Jani Ursin’s (2013) research on the effects of higher education changes on researchers’ identity. “The narrative of job insecurity” that emerged from their qualitative data consisting of academics’ experiences in different phases of their career comes close to also many of my informants’ experiences, especially for many of early career researchers or those who had work experience from universities. The narrative highlights the stress and anxiety that researchers experience due to the temporality of contracts and the threat of unemployment. (Ylijoki & Ursin 2013, 1141-1142.) Thinking about other career options is characteristic for the narrative and was also highlighted by one of my interviewees, a post-doc researcher who explained that through the programme it is also easier to look at and be aware of other potential career trajectories. In case academic work gets too insecure there is a plan B, since in informant’s own words, “one does not want to be an artist” (Post-doc reseatcher, Interview 8).

> ”On one hand, academic work generally demands a kind of persistence and that you are able to build long-term. On the other hand, when it comes to funding and jobs, it is quite insecure. So, there are these kinds of contradictions I would say. These are the kinds of, this does not relate to that, in fact I perceive that this project, I perceive that this was like a really awesome thing with regard to my personal working life. That you may suddenly concentrate, you have five years’ funding or something, so that is something that, this cannot even really exist”. (Post-doc researcher, Interview 8, Q5)

As general motivations of being a researcher, many of the informants discussed, for example, bringing in new subject matters or finding new angles to old issues, solving out interesting topics, learning and finding out about new things, understanding a phenomenon better, general curiosity and opportunity to question and form new questions. In addition, professionally made research, the pleasure of the actual practice of

research, participation in scientific conversation as well as collaboration with nice, interesting and skilled people were mentioned.

> ”Well, generally as a researcher it motivates that one can find new information and that, it has some meaning sometime on something and like. Nevertheless, I have conducted quite basic, not anything that commercial, like you also do in quite a different way. Maybe one cannot call it exactly basic research what we in here anywhere do, but as basic as one can [in a sectoral research centre] conduct. And well, learning and finding new things and then, and of course when [in this field of research], then there is, there is some kind of a linkage to making the world a better place and the like, that climate change and these kinds of things could somehow be managed.” (PhD student, Interview 2, Q6)

It seems that “interpretive flexibility” (Star 2010, 602) of strategic research – vaguely defined, open-ended aims – enable participants to include their professional needs through local tailoring. Having an impact or meaning on something as well as changing something for the better (e.g. environmental and societal conditions, decision-making, habits) through science were also often discussed as general motivations of being a researcher. Substance or interest of knowledge was often intertwined with utilizing research results for some purpose regardless of the informants’ scientific background. A couple of interviewees did not speak of further relevance or utilization, others discussed participating in changing something more as an additional benefit and some discussed having a societal impact more as the main starting point for research. In addition, internationality, and helping new students succeed and progress in their research were mentioned. One of the professors highlighted peer recognition as an important aim, the will to show others that one is able to be productive in science and do it well. In addition, one professor said that being able to lead a big consortium is desirable and the programme offers an opportunity to try it out.

Some of the informants perceived that the programme’s emphasis on having an impact is very motivating, describing that the programme offers bigger shoulders for researchers since they are part of a bigger collective forwarding an important shared goal. I observed that usually informants who did not face as much controversy regarding the research agenda (e.g. due to diverging interests, exclusion in research collaboration) were more likely to discuss the enhanced motivation of making a change through strategic research. For some of the informants the engineered shared space of SRC, hence, provided enhanced, strong feelings of empowerement towards forwarding a common aim. Furthermore, it created legitimacy for being able to direct development trajectories.

Thompson and colleagues also found in their research on collaborative projects that both the scientists and stakeholders experienced this kind of a self-efficacy factor (see Bandura 1977), which provoked feelings of motivation and meaningfulness among the participants (2017, 33). Rask and colleagues (2018) also found in their research on processes of public participation that there was an "increased agency of individuals to take part in political and social activities" with participants who were involved in the activities of PE (public engagement). With this finding, they indicate the concept of "political efficacy" (Balch 1974, Craig 1979) which has been widely used especially in political science to describe citizen's trust in government and their belief in understanding and impacting political processes. It has been shown that higher levels of political efficacy correlate with higher participation in political processes. (Rask et al. 2018, 97.) Participants, hence, use strategic research to extend their involvement, for example, in decision-making and other spheres where one has now more legitimacy to work in through strategic research.

> "[--]…But I have two maybe the most important motivations in this project of which…that I perceive that the [subject of research] is very interesting and important. And then a motivation regarding this strategic research project is in particular that it aims at having an impact. That it genuinely has the goal through which it aims at bringing research results to the awareness of decision-makers, interaction partners and more broadly to society. That it has the kind of, very strong aim for impact. And I think it is motivating that there is a kind of legitimacy for a good cause one believes in. That it is also aimed at forwarding, like those thoughts elsewhere" (Senior researcher, Interview 1, Q7)

Miettinen has found that common to transdiscursive terms is also this kind of "empowering function" that they entail, which mobilizes different communities of practice to work for common aims (2002, 140). In addition, depending on one's project orientation and academic interests, one may, through the legitimation that the programme offers be able to defend activities and aims that are not always in line with each other. SRC legitimates the emphasis to interact with different communities of practice: researchers and stakeholders of various backgrounds. The programme gives permission to the work between different organizations. Consequently, participants may not have to ask as much legitimation for their activities from the other organizations outside the programme. This may expecially be the case in situations when funding comes solely from the programme, as shown in the following extract:

> "This is one hundred per cent funding. So it is really easy for me to say that if in the university, lets get back at this soon, but if it feels like my university has

> different kinds of goals in comparison to Academy of Finland so I can say that well here it is the sort of thing, that the funder of this thing, well I probably need to listen to them quite much. Besides, we have applied for a project, set goals in there, we cannot slip away from them. So this is in fact quite a fun arrangement because in a way case-company, university, researcher and funder, they all have enough say in the issue. And basically then none of these kinds of peculiar, multi-sided aims will emerge. Two sheets. If there is hundred per cent funding, on top of that side expenses, I ask that with which mandate will for example university tell you that this research, that you should do a little bit more of some other thing A." (Post-doc researcher, Interview 6, Q8)

5.1.3 Communication across communities

Similarities among interviews showed that the organized inclusion of SRC programme (e.g. the interaction plan and consortia rules) also assists in facilitating communication across different communities of practice (Bowker & Star 1999). This kind of boundary-crossing function is according to Miettinen also prominent for transdiscursive terms. It enables participants to cross borders between various communities, also ones that have not collaborated before (2002, 139). SRC facilitates encounters, like a boundary object providing a vague "shared space" (Star 2010, 602-603) for seeing new perspectives, discussions and different sides to the studied phenomenon.

> "So I think that both are surely still quite permissible and important ways of doing but it is nice that one may also broaden one's own perspective as well as learn new ways doing and thinking. That not necessarily some totally new kinds of research questions or something but perhaps like something, the phenomenon's complexity and different viewpoints and sides, so to them somehow, so they come fourth well through the interaction." (Post-doc researcher, Interview 13, Q9)

The projects and their consortia are seen as very large in most cases, larger than many of the informants have experienced before. There is one exception to the case, however. A researcher with experience from the SHOK projects addressed that the SRC project consortium is smaller and more convenient than in SHOK projects in which people barely met each other or were kept updated on the progress of the team's research.

For example, some perceived that through SRC the perspectives of stakeholders come across more visibly. According to one post-doc researcher, two senior researchers and one professor, stakeholder interaction is through SRC much more present in the research process. This has actualized for example in the form of common discussions and workshops on the direction of research. For one professor the research collaboration with state research institutes' researchers was a new thing. One senior researcher explained

that the consortia is the most cross-disciplinary one has ever participated in and hearing about, for instance, a future studies perspective is in general something very educational, even if one would not utilize that perspective in one's own research. Informants often made distinctions over the type of research they and others do based on funding sources and organizations. The thoughts on what kinds of research projects are desirable and on how to make an impact in society varied between researchers, highlighting the diversity of perspectives included in the data. A couple of researchers with a background in natural sciences perceived that the perspectives of researchers coming from the disciplines of humanities and social sciences were something new. They wished to continue the connections after the project.

> ”And in this distinct project there is this [university faculty] or [field of research] and then this, our engineering viewpoint and then [another university faculty], so one has been able to see a different kind of perspective.” (PhD student, Interview 3, Q10)

Many of the informants explained that the programme provides an access to different discussions (e.g. on societal impact and science), tasks or side projects that would perhaps not happen without making different people meet. New skills may relate to learning about popularizing science, scientific advising and social media, coping with scientific peer review as in the case of one researcher for whom it was at first difficult to manage. Networking and generally knowing more widely what other people are doing were suggested as things that have come with SRC. In addition to being generally eye opening, awareness increasing and educating, many of the informants experienced that hearing diverse perspectives and having different groups studying the same phenomenon can at best make their research more comprehensive and genuinely better. They explained this by having achieved a more profound understanding of different phenomena, having seen better their messiness, wholeness or complexity from the side of other researchers and actors. A couple of informants explained that common discussions and co-writing had also helped them to modify their own research questions.

> ”So in a way perspectives have broadened but also understanding this phenomenon what we are investigating as a whole. This [subject of research], regarding that one has understood that people look at it from different angles in a certain way. It feels like one can understand the wholeness of the phenomenon also better because there are many different groups involved and everyone brings their own, one could say, viewpoint along in some way. So, it helps to understand that some may have very like technology-oriented starting points for understanding [the subject of research], some may be this kind of economy sociology-oriented, and so on, or consumer-sociology-oriented like we have

> [stakeholder], well this one group that works on this side more so, there is like, of course one understands the starting points for its interpretation then." (PhD student, Interview 3, Q11)

Engineering a shared space for different communities of practices may also result in new alternative side projects. These kinds of experiences were present in my interviews. One of the professors explained that developing a new participatory data collection method with the partners they are collaborating with has been a successful new opening. Networking with researchers from various backgrounds has also resulted in a new research project when one of the consortia's members contacted a senior researcher from the field of natural sciences. This new side research project goes out of researchers' core research area, combining disciplinary approaches in a new way.

> "So, in that sense this has brought these kinds of side projects that are surely quite pleasant and which I would not certainly have undertaken without this consortium since it is not anything like my core research. But absolutely this is interesting if we look at, combine [impacts of subject of research] to [impacts of another subject of research]. If we get something, we can from there manage to get this kind of meter, that we get two good, two birds with one stone- type of a thing." (Senior researcher, Interview 5, Q12)

5.2 Incohesion in cross-disciplinary interaction and inclusion

During the analysis, I found that there were differences in participants' adaptation to SRC at the level of research collaboration. In this section, I will show examples of these cases in which the flexible characteristics of SRC did not concretize equally among the informants. Differences occurred in relation to problem-framing and solving, interaction, delegation of tasks and between categorizations of research. The differences indicate that there were instances of exclusion and disintegration in collaboration. The differences in adaptation were in particular consequences of dissimilar academic orientations and interests (prior professional background, interest of knowledge and view on science's social impact, skills, competences, interests, attitudes, expectations and personal traits), project orientations (object of shared benefit, organization of interaction, prior collaboration with consortia members), career phase and position (delegation of responsibilities, level of experience from other projects, other available options for future career progression) as well as power relations.

5.2.1 Unequal co-framing of problems and solutions

Although I found that researchers were all able to fit their subject of research as part of the overall programme quite easily, there were tensions regarding the co-framing of the strategic problems and solutions. Among my informants, researchers with much previous experience from Academy of Finland's projects with humanities and social sciences backgrounds faced these controversies more than researchers with much experience from state research institutes, Tekes funding and charasterically the more applied research projects (e.g. Late & Puuska 2014). In the light of my data, naturalization (Bowker & Star 1999) of the concepts of societal impact and interaction did not happen equally within the collaboration. This means that some conceptions were able to gain a more dominant position in determining the standards of impact and interaction at the collective level. Even when a shared space is engineered, it may not necessarily be by itself sufficient as a "means of translation" (Star 1999, 297) in addressing the different epistemic perspectives within collaboration.

I observed this by looking at how my informants described their background in relation to strategic research's collective approach and the extent of content and discontent they expressed. Senior researchers and professors from state research institutes or many years of Tekes and EU funding experience made comparisons between university research and state research institutes' research. They emphasized that there are differences regarding the conduct of research in different organizations, indicating that impact and interaction have always been present in state research institute research and research under Tekes funding. In comparison, they perceived that university research and Academy of Finland funding focuses more on basic research. One of the consortium leaders also explained that the interaction patterns used in the SRC consortium were largely adopted from the state research institutes' structures. They just then had to be combined with the scientific criteria of universities. Consortium leader further explained that state research institutes (of prior working experience) would conduct the same kind of research, even if there was no SRC programme. The research in itself has not changed, just the way the results are presented to stakeholders. Hence, consortium leader stated that in the SRC programme they do not concentrate solely on academic publications, but also on making them relevant and compact enough for stakeholders and different societal actors.

"-Okay. So, there is then no notable difference?

> Not as far as, nowadays indeed at least [in state research institute] almost all of the projects are like this. Instead, if one compares it to projects in the university world there is a big difference. There are relatively more perhaps the kind of, for example, Academy funded projects where the focus is on solving some ecological research question. It can be quite specific as long as it is top quality science. And in there one does not necessarily need the kind of transdisciplinarity, that it is only most important to have the world's best around the same subject of research". (Professor, Interview 9, Q13)

> "We have, well of course [state research institute] is, was previously also a sectoral research centre and we have had a lot of stakeholder interaction. Much more than for example university's this kind of basic research traditionally. So, we have had, historically much collaboration with ministries and we have conducted research then like, for example Tekes-projects, they are not so common in universities but we have also previously had Tekes-projects." (Senior researcher, Interview 1, Q14)

Diverging interests of knowledge, attitudes, perspectives and epistemological-ontological approaches (deriving from divergent disciplinary and organizational backgrounds) were hence visible in interviews. In my data, they only provoked controversies among participants coming from humanities and social sciences backgrounds with a strong Academy of Finland funding and university research profile. They had to constantly balance between their own research contribution and the collective approach within the project. In a researcher's own words they "have to be the underdogs of the collaboration" (Senior researcher, Interview 15). According to my data, for researchers whose approach is more easily seen as applied by character, it was easier to acquire a hegemonic position regarding naturalization (Bowker & Star 1999) of impact within SRC.

> "It may have in other groups been so that it is not so visible but in some, with some whom I have discussed, so there is just, well there is the kind of, there is a kind of gap. It is just a whole another type of way to conduct research and think. I perceive that there is, that it is, how would I, this is a stupid word but in a way unfair that since the researchers of state research institutes could have already been able to do all this, so why us, when we again have our own competence, then why could not the competences just be combined, why did it have to be made into this kind of a thing? (Professor, Interview 11, Q15)

Informants who felt these tensions explained that the composition of research questions is different in sectoral research institutes in comparison to universities. In addition, according to these informants the atmosphere in SRC programme's common space sometimes dismisses some conceptual or theoretical points as "again those university researchers' things" (Professor, Interview 11). Moreover, they explained that both

approaches are valuable but the other one is now much more dominant, excluding their approach. A senior researcher who had previous experience of also some Tekes projects explained that the SRC project is very similar to them. This was further explained by the focus of SRC's research framing and some structural factors, for example, advisory groups, being a common feature of Tekes projects. Subsequently, the experienced dominance within collaboration was not a novel situation for the senior researcher, but rather a very typical setting from prior Tekes projects.

For example, the senior researcher perceived that the project is "clearly product development research for the needs of the technology industry, although it has not been stated out loud" (Senior researcher, Interview 15). Further stating that as a researcher with social sciences and humanities background, one has a critical standpoint on whom the research is conducted for and how it is going to be used. The informants who experienced these tensions explained that they would rather want to study the issue and its consequences in a larger picture, not just the micro issues in usage. They perceived that they neither want to squeeze a complicated issue under a narrow impact framing.

> "For example, we wrote this sort of road map regarding this, and it was, how would I say, a little bit difficult to stand behind it with regard to all of its aspects, what it said, even though my name and everyone's name was written on it. But that, how the roadmap presents [the subject of research, its development and ways of promotion], well I do not agree on the fact that it should be promoted." (Senior researcher, Interview 15, Q16)

> "Yeah, is it scientific research even in some way or is it this kind of applied in the service of government, or is it then…" (Professor, Interview 11, Q17)

These differences are consequences of diverging academic orientations, interests and power asymmetries. Relevance of science is versatile and happens on varied of ways (e.g. Miettinen et al 2015; Molas-Gallart 2015; Koskinen 2016). Academic orientations that have more easily measurable impacts, for example those that focus on directly supporting the operationality of economic life or ministries, may end up having more power in setting their previous and current work as a collective standard of societal impact. In comparison, orientations where impacts are harder to measure or that do not readily fit the indicator measurements of the SRC programme may need to defend their relevance more. Academy of Finland and Tekes, as well as state research institutes and universities in spite of their similarities, have had differential missions and focus areas for research for a long time. The relevance and societal impact of science may vary even within a same institution or

discipline (e.g. Hakala & Ylijoki 2001). Impact is inherent in science but in contestation over relevance some forms of impact may gain a hegemonic position in collaboration. The researchers who experienced these controversies see impact as something that is inherently present in the content and form of their research. In relation to these thoughts, one post- doc researcher with a more theoretical-philosophical approach to the researched issue, also wondered whether it would at some point be possible to go back and also develop the theoretical concepts further after the empirical work. Thus, some informants had to justify the relevance and impact of their perspective more in the collaboration when there was contestation over relevance. The two informants in a similar way highlighted that it certainly depends on how impact is defined, whether a certain kind of development it impactful. Due to the dominance in framing of impact within collaboration, they might need to manage anxiety and stress as one form of invisible articulation work (Star & Strauss 1999):

> ”[--] because I think this impact thing is just the kind of, it really worries and gets me anxious, that how is it, how is the concept defined then. Because now it, the more time passes and the more it is within the top scheme, the more the conceptualisation of impact will happen within an administrative medical framing. It was at the beginning merely a nuance but now it is already really direct. Now the project’s aim is surely to count indicators, create indicators and conduct the kind of impact research, that is, the [state research institutes’] framing has emerged in there terribly strongly.” (Professor, Interview 11, Q18)

Power asymmetry in framing and solving problems and between different conceptions of research impact was hence visible. Fast, top-down schedules and frequent impact rapporting demands may also increase the difficulty of addressing power asymmetries between sciences and their different forms of impact within the collective. This can be the case in particular if some of the research approaches and conceptualizatons are more compatible with SRC’s indicators than others. For example, humanities and social sciences may gain their impact in various ways that cannot always be measured quantitatively or commercially. Consequently, they may on that basis have a weaker position in situations where impact has to be counted for with the currently available measures. Not suiting the available conceptualizations and measurements does not, however, in any way mean that these sciences were lacking societal impact. Inkeri Koskinen (2016) addresses the gap that exists between the current discussion on impact and the actual diversity of societal impact among different disciplines. As one example on the societal impact humanities have had, she points out the development of Finnish language and its wide effect on Finnish culture and society as a whole. She also suggests

that perhaps humanities' researchers could learn to offer more justifications for the relevance and impact of their research, since the societal impacts of these sciences are manifold but not spoken of enough. (Koskinen 2016, 33.) The possibility to write qualitative narratives of SRC (Appendix 3) collectively could offer a way for expressing these impact trajectories, enhancing collective understanding of different forms of societal impact better.

In addition, when the problems to be solved are very complex, it may be easier for some research approaches to gain a hegemonic position in defining the nature of and solutions to problems. If some approaches gain this kind of a dominating position it may then be challenging for other approaches to integrate their own perspective. Vague strategicness, diversified legitimation and organized inclusion that enable the access of various approaches under the same framing, may within collaboration shift into a form of one. Hence, even when boundary objects facilitate collaboration between communities, there may still be uneven opportunities to act within the collaboration. For example, Ismo Huvila (2011) observed the expressions of power in a study on archaeological reports as boundary objects. He found that "the complexity of documentary artifacts can help antagonizing discourses to accommodate the primacy of a hegemonic viewpoint as a part of their own system of articulations" (Huvila 2011, 2538).

Evelyn Brister's (2016) concept of disciplinary capture is very useful in conceptualizing these experiences. By disciplinary capture she relates to situations where decisions within a collaborative project are not taking into account all of the takes on the issue in a similar way. This also relates to situations where decisions are made already very early on, for instance, by external contributors, such as funders or stakeholders. As a result, it may be difficult to alter the dominating ways of working and thinking later on as the project proceeds. In this situation decisions "are more likely to cascade in a pattern that conforms to the epistemological commitments of a single disciplinary framework" (Brister 2016, 84, 89). Brister clarifies that this situation can take place even when everyone is genuinely committed to collaborate. It is thus not to be seen as a question of "bad faith or nefarious intent on the part of the researchers whose disciplinary standards take precedence" (ibid., 84). When this situation emerges, it may lead to the so-called victims of the capture to become less and less invested in the project.

> ”I [the reason for inviting a researcher to join] see this more like the kind of a game in which it was perceived that chances to pass a project are bad if its merely a technology-driven project. ” (Senior researcher, Interview 15, Q19)

Like the above-presented extract shows, a researcher who does not feel fully included may then perceive that inclusion in the first place only serves a false impression of, for example, the project's ethical orientation. This resembles an issue that Arie Rip (2014) discusses in relation to "responsibility wash". A senior researcher argued that these issues have not been spoken about upfront. The atmosphere in the consortium is good and the tensions have not (yet) led to conflicts. According to the researcher, however, their critical perspectives are not taken into account nor having an effect on the direction of the project. Both of the researchers who felt a similar kind of controversy, although on different levels due to the differing contexts of the projects, argued that the critical stands should certainly be taken into account more. This critical, questioning perspective that the informants presented may also be seen as one notable part of the societal impact of social sciences and humanities. Through providing this perspective, for instance the contradictions and potential social problems relating to a certain development trajectory may be analyzed. Consequently, providing a critical perspective may have many practical impacts when taken into account regarding a given issue, also in policy processes.

A senior researcher stated that expressing the concerns publicly outside the project would not put the researcher, who already may be in an insecure position, in a favorable light. The researcher explained that one is ready to be flexible and co-work with other people if there is some kind of a workable compromise, but not ready to attach one's name in papers that one does not stand for at all. One may still in spite of this keep on researching one's own subject of research within a smaller research group under the flexible characteristics of SRC. In order to continue collaboration, it may for some participants hence be easier to hang on half way within collaboration. Rather than resisting loudly, one may as a form of articulation work (Star & Strauss 1999) distance oneself of the dominating objectives of the project:

> ”In that sense, for example, the way in which this project is communicated to public, I cannot as a researcher perhaps stand out to criticize certain [theme of the research] discussions that are currently going on about [the theme of research] that I perceive as wrong information about what can be done for [the issue]. I cannot as a researcher of this project for example, [a little laugh] in public in the name of this project present, or lets say that in principal I can of course but it is not terribly favourable, or the reaction to it is not very favourable.” (Senior researcher, Interview 15, Q20)

In spite of these conflicts, they both saw that there has been more discussion and change of perspectives through participation within the engineered shared space. A professor was also satisfied that they had finally managed to organize one discussion on the conceptual-methodological underpinnings of their project. These kinds of suggestions for new openings and discussions may also be a form of articulation work, one that however requires a lot of individual effort. According to informants who experienced tensions with projects' impact framing, there should be more responsiveness and all the interests and conceptual-methodological starting points should openly and equally be discussed with all the actors who are involved, also the funders of the programme. In spite of tensions, conducting research that the informants are interested in, gaining interesting research results and publishing in scientific journals and articles, and, moreover, reaching the international level has been possible throughout the programme with the help of strategic research's flexible characteristics. The researchers who faced conflicts due to the hegemonic positions in collective framing and solving of problems, needed to, due to imposing impact categorizations, practice a larger amount of articulation work (Star & Strauss 1999) than researchers who felt more at home. "The more at home you are in a community of practice, the more you forget the strange and contingent nature of its categories seen from the outside" (Bowker & Star 1999, 294-295). In addition to academic orientations, differences in adaptation may also derive from the diverging project orientations of SRC. Some of the projects may face more controversy since they aim at something fairly new and work with actors that they have never worked before. In addition, projects' collective aim and shared benefit differs. It is useful to take into account that some projects may have more qualitative and value-laden characteristics included than others.

5.2.2 Imbalance in interaction across and bottom-up

All of the PhD students and a couple of the post- doc informants whom I interviewed often spoke of interaction and impact as something that they have not fully participated in. They experienced that there are impact levels that are out of their reach, and tasks that do not yet belong to their career position within the programme. Some even perceived that they had not really participated in the interaction activities since they are rather activities that the consortium leaders, leading consortium members or the more experienced researchers participate in. Interaction was in these cases described as

discussing, communicating and presenting research results outwardly to politicians, relevant experts and other stakeholders outside the consortia.

> ”Well it depends on a person. Since I am in a way working only as a common researcher I have less interaction. But well, of course the lead of the programme has a lot of interaction and in that way...” (Post-doc researcher, Interview 8, Q21)

These experiences may derive from the career position and subsequent delegation of tasks and organization of interaction within the programme. In spite of the visible cluster of these perceptions, there was, however, one exception to the case among the early stage researchers. One of the post-doc researchers said that interacting with policy-makers and politicians has through the programme increased notably, for example, in the form of presentations and discussions. Perhaps the division of tasks within the consortia makes it more unlikely for early stage researchers to be included or aware of the assimilation of the research results e.g. in policy processes. The nature of the acquired membership in the community of practice (Bowker & Star 1999) may vary according to the participants' previous experience.

> ”Outwardly I cannot say for sure, that, I have not indeed been involved in that interaction…like outwardly….
>
> - Okay. So it does not have an effect on your work then in a notable way?
>
> ”So, no, no. Not really in a notable way, I just work on my own part and then hopefully someone makes use of the result.” (PhD student, Interview 2, Q22)

In addition to imbalance in outward interaction activities, many of these early stage researchers also spoke about a lack of interaction across disciplines within the consortia. Even though all of them thought that the project in itself is very multidisciplinary, their work was according to them still done as an individual project without that much of cross-collaboration with other participating researchers. It is also important to note that these early- stage researchers came from diverse fields of research, e.g. natural sciences and education sciences, and still their perceptions were quite similar. One of the post-doc researchers further explained that it feels like a lot of the interaction is being practiced through different hubs, such as steering groups and executive committees, leaving the interaction at the level of researchers coming from different disciplines quite narrow. The experience of researchers working in their own silos was also addressed by a couple of other early stage researchers.

> ”Yeah. Well it basically works or suits in a way, but I still, when it comes to the actual research, it is still quite me- driven. Or I mean that…that if I want the research to progress, then I need to, or I surely write and conduct my own research then [laughs].” (Post-doc researcher, Interview 4, Q23)

One of the post- doc researchers compared strategic research to an earlier project arguing that there is less bottom-up meetings among researchers in SRC programme. A PhD student in a similar way explained that they have a few workshops in a year, but in the end the interaction happens more with the researchers from the same field who are sitting close to each other. One post –doc researcher hoped that through the project one could have more co-writing with other researchers who are interested in the same issue, but it has not happened since one still writes and works very independently.

> ”- Yeah, well has it changed the conduct of research in some way or being a researcher in a way, this interaction that has been present in this project?
>
> Well maybe not necess-, or it depends on how much one does interaction, it depends so much on oneself. One can always stay and do in everything, one can stay and do…or then one can contact people. So, it is just about one’s own, what kind of mood one tends to have” (Post-doc researcher, Interview 10, Q24)

Ulrike Felt and colleagues (2013) made a similar kind of finding in their research on PhD students’ perceptions of transdisciplinary research. In one group within a doctoral school, students found it challenging to make a distinction between the work they did previously and the new transdisciplinary way of working. They experienced the notion of transdisciplinarity to be rather ambiguous and were not sure if it actually even existed. Another group of PhD students they interviewed perceived that the available procedures were not adequate or desirable enough. They felt that there were not enough tools in theoretical nor methodological sense to respond to the high expectations of transdisciplinary ideology. (Felt et al. 2013, 517.)

Overall, the experiences of a lack of interaction across disciplines could also mean that integration at the level of research practices may not happen automatically by facilitating a common space for actors through the project. This can be the case in particular when there is not enough time and facilitative tools for combining the different disciplinary approaches at the collective level. If interaction is organized formally through many official hubs such as steering groups, it may also end up keeping researchers in distance from each other. There is also a possibility of this being a more general phenomenon going beyond early-stage researchers. Many of the more experienced researchers also

discussed the challenges regarding combination of dissimilar disciplinary approaches. Early stage researchers' expectations of interaction may also differ from those of the more experienced researchers. In general, the aim of going beyond awareness raising of different perspectives was often seen as challenging, although very rewarding if managed properly. Scientists coming from different backgrounds may not, due to dissimilar terminologies and research approaches, always fully understand each other without having enough support. Even though engineering a shared space provides a window to different perspectives involved, it may not always be sufficient in itself to integrate them in practice.

> ”For example, it means that if I am using some kind of a modeling approach and then another one produces data in a certain way but they are not like compatible. And how like those, in a way the compatibility issues between sciences, when one can solve them it is very rewarding. One can discover that conducting multidisciplinary research is really possible. But challenges related to that is that like, sometimes it feels like one speaks a whole another language. And when one explains something, one just does not really understand what the other one really means, what one talks about. Or when speaking one notices that the other one does not. So these are like very small things from where it derives from. But this mirrors the challenging sides of interdisciplinarity.” (Post-doc researcher, Interview 10, Q25)

The difficulties that my informants had faced in aiming at combining disciplinary approaches were not as visible among researchers who had known and collaborated with their research partners prior starting the project. They opinioned that the collaboration has thus worked very smoothly. In addition, they argued that due to the strict time schedule it may be very valuable, and almost necessary, that researchers and organizations working together know each other, at least partly, in order for the project to operate successfully.

> ”Maybe surprising has been the fact how big a significance it has in the end had that the organizations that are collaborating together have already been collaborating for a longer while.” (Senior researcher, Interview 1, Q26)

Dana DeHart (2017) also found that often the team scientists whom she interviewed addressed that awareness of who one is going to work with is important to acquire prior starting the collaboration. This was due to challenges stemming from divergent ways of thinking and working as well as disrespectful manners. (DeHart 2017, 462-463.) In a way, knowing the partners beforehand might also increase the likelihood of not ending up in new kinds of collaborations. With regard to imbalance of interaction bottom-up and

across, it was also common that funders and organizers of the programme were perceived as quite invisible by the informants. The informants often spoke of funders in an abstract manner when they discussed fulfilling the wishes of SRC. One professor addressed that they are lacking interaction with the Council of Strategic Research and the policy members responsible for organizing the programme.

5.2.3 Deviating position of "basic research"?

In spite of all the informants (with a more "basic" or "applied" research orientation) being able to study the subject of their interest in the programme, many of them were still concerned for other disciplines and fields of research that might not be seen as relevant. Concern for the organization of and cuts in research funding more generally were often expressed when I asked about their thoughts on the claims of science becoming "politicized". Politicization of science was not seen as a main concern, but instead the distribution of funding to diverse disciplines was. Research of which end-result or utilization potential one does not know before hand, basic research and bottom-up research were often described as the type of research one would be concerned for if the science policy trends on relevance were to continue.

> "I partly agree [when asked about the claims of science being steered politically] that if all of science is harnessed through the kind of funding instruments such as SRC, as slaves of fully top-down defined research aims, then that is not a good development. I perceive that absolutely the biggest part of science should follow through with a bottom-up principle because that is where the biggest findings come from." (Professor, Interview 9, Q27)

A few informants did not mention concerns over the funding situation and cuts, but still expressed that strategic research differs from basic research and from the kind of research that is conducted without a need for utilization. In addition to this, concerns over funding cuts of Tekes and state research institutes' funding were addressed by a couple of researchers. In general, concerns related to the possibility of various research areas, disciplines and practices to dry out or disappear if the distribution of funding is unsystematic, with some research areas having masses of funding while others none, were expressed. One of the professors, however, addressed that the founding of the SRC ptogramme has actually made the field much more multifaceted, and helped to spread the funding more widely to diverse fields of research.

The concerns that some of the informants expressed over science policy trends also related to the unawareness over the relevance of future, insecurity of knowledge and unpredictability. Some informants perceived that not all of research can be strategic even though they are satisfied and it is experienced as a valuable, and special research programme. As a reason for this they argued that the funding of basic research without top-down research framings should still be secured even when it might not seem relevant for stakeholders. A senior researcher stated that Academy of Finland should rather fund critical technology research instead of product development research, the latter being in any case already more popular in Finland. In addition, the researcher said that one has nothing against it, but phenomena should be researched as a whole. Moreover, critical discussion should start off from research, since it will not come from anywhere else and is also a prerequisite for good innovations, the researcher concluded.

In is interesting that at the same time, informants often however explained that in the SRC projects the themes are still wide and vague enough, preserving the flexibility and autonomy of their own conduct of science. This way they are using strategic research for boundary work (Gieryn 1983) as an act of articulation work (Star & Strauss 1999), in distincting their own piece of work as separate from the upper demands. Not everyone could, however, do this with as much ease as it was noticed that due to the power asymmetries within collaboration they may have to practice more invisible work than others in order to keep their "information and work requirements" (Star 2010, 602) satisfied.

5.3 Increasing demand for contested "other work"

I found there to be differences in participants' adaptation to the programme at the level of new tasks, requirements and roles that SRC programme has introduced. For all of the informants the new activities became the "other work", done in addition to science. According to my data, differences in perceiving the demand derived in particular from career phase and position (delegation of tasks, level of experience from other projects), academic orientation and interests (prior professional background, view on science's societal impact, skills and personal traits) as well as the orientations of home institutions outside of the programme.

5.3.1 Interaction and impact as additional tasks to science

The naturalization (Bowker & Star 1999) of the concepts of interaction and impact as third missions of science, distinguished from the "epistemic missions" of science (Miettinen et al. 2015) was visible in how many of the informants discussed impact and interaction as additional outward activities to science in the programme. For instance, in one interview the exciting successes in interdisciplinary collaboration were described as something that occurred in science, between different disciplines. Subsequently they were not described as activities of societal impact, which were in turn discussed in terms of outward interaction. In this case the tools and methods of research initially differed from each other and did not match. After being able to solve these issues through interdisciplinary collaboration it was a great reward and gave assurance that conducting interdisciplinary research is possible.

In many cases informants hence explained that science as an activity has not changed but through the programme there are, however, new additional tasks and roles that researchers take part in more often than before. This became the other work that informants were increasingly including as part of their daily activities. The division between other work and scientific work has been found in other contexts as well, indicating that in any case academics' work includes tasks external to the conduct of research. Johanna Hakala (2009) examined junior researchers' academic identity construction and work motivations and found that researchers were in a similar way balancing between the work they saw as their "own" and other work. They were two different kinds of options, either gaining a wide expertise in many things (such as teaching, equipment maintenance, lecturing) or focusing on dissertation work and aiming at succeeding in finishing it properly. (Hakala 2009, 180-183.) It seems that participants have through SRC adapted to additional other work under the title of science's societal impact and interaction. This other work consists of scientific advising, social media activity, blogging, popularizing science, presentations and workshops with stakeholders.

> "Yeah. I perceive that it does not change the research itself in any way. Like that conduct of research nor the process of research or schedules. So they are done in the time which...that it has not changed in any way even though there is in a way more pressure to publish quickly or something else. But they have not…the structures have not changed in any way. What has changed more is exactly that especially these academic researchers are used to talk about their latest publication with the limitations, regarding what it focuses on and we can talk about just that, what kinds of results this research produced. But then again…Chancellor is not interested in the latest but rather in what you have done the last 10 years of research on and what should we do about this when the situation is like this. So in a way then, what it demands from the researcher is that research knowledge,

> accumulated research knowledge, it does not necessarily even mean your research results solely but instead that what is known of the issue." (Professor, Interview 7, Q28)

Requirements of interacting outwardly have by some of the informants been taken up very actively and with dedication. This has resulted in an increasing amount of for instance social media usage and blogging. A few of the informants explained that the programme in an almost obligatory way forces the actors to work for these certain tasks, otherwise one would not necessarily end up practicing them. They in turn take a lot of individual responsibility in enhancing the prerequisites of succeeding in them in practice. In aiming at managing the requirements, they for example practice communication and popularizing skills in their own time, as one form of articulation work.

> Well, perhaps it once again relates to that, on the other hand when one is encouraged or forced to communicate, do interaction more and show that it has been done, it in a way forces one to learn to also do it better". (PhD student, Interview 2, Q29)

In line with the experiences on taking the new requirements seriously and changing behavior accordingly as well as discussing impact in terms of outwards activity, it has also in other contexts been found (Bormann 2011, 174-174; Weingart 2005, 126) that scientists may indeed start to adapt indicators and requirements in their behavior. This has been indicated in studies around bibliometric indicators (e.g. Butler 2003) and helps to show the effectiveness of guidance and recommendations. In spite of recommendations being non-obligatory, they become something that participants actively think about and may reproduce through their work.

> "I do not know if all the projects have taken it [laughs] seriously, these certain kind of terms or the kind of like, what SRC means.
>
> -Yeah.
>
> [little laugh]
>
> -So what does it mean that you have taken it?
>
> Yeah, that not in that way that ok, money is here, that we would just do what we please and try once in a while, that we have some communications person who sometimes tweets, that somewhere, and that it would seem like we are active. Rather we have in some way taken it seriously, that now we then practice this new kind of, sort of because we have this group now and all of the researchers have been put to wri- or we do not have that we would do this, or that certain communication people would do something but rather…

> Yeah so all the researchers do.
>
> …rather all the researchers tweet – they have been delegated turns, that they write blogs and tweet and that we have basically taken the approach that everyone now learns a new kind orientation to the world [laughs].” (Post-doc researcher, Interview 4, Q30)

A few of the informants clarified that one can still decide on how much one interacts in their own time since no one actually forces anyone to do anything. For example, one post-doc researcher with no experience of Twitter, added that active communication has not been obligatory even when it has been asked by consortia members a few times already. It was however something that the researcher actively thought about or even struggled with since more active outward communication had been increasingly recommended in the programme.

5.3.2 Questions on career, life and project management

The programme consists of different kinds of classification systems that Bowker and Star (1999) see as central in organizing boundary objects. Classifications, categories and standards may be very powerful in their invisibility. They, however, often become more visible when being contested or questioned. (Bowker & Star 1999, 319, 3.) In my data, this happened in cases where the new communicative tasks were not something that researchers felt comfortable practicing due to a lack of interest, skills, expected levels of extroversion, incentives and resources. It also happened when the SRC indicators and requirements were seen as too narrow for measuring societal impact of science at large – in other words, when they did not make justice for the bigger picture and the efforts researchers put into their work.

The demand to write impact narratives and to account for societal in addition to scientific impact indicators divided opinions among the informants. Especially one senior researcher and professor with many years of experience from academia strongly resisted the requirement. Other one of them was at first very shocked of the demand, because researchers are used to writing science texts instead of short narratives. A few of the early stage researchers on the contrary argued that the impact narratives have been quite a positive experience and a better way to measure societal impact than the mere quantitative indicators that do not include all of the potential aspects. They also opinioned that the requirement helps them to think about their research’s overall impact more. One of the informants did not regard assessing societal impact as a problem in any way, but

considered scientific impact indicators and getting scientific articles approved as a challenging learning process in the programme. Overall, thinking about fulfilling both the scientific as well as societal impact indicators within the programme is something that all the researchers in the programme do. The utility-demand and time spent in applying and proving the value of research, in other words "other work", caused frustration among many of the informants.

> ”And not the substance-side when here nevertheless the basic question is very challenging. And another thing that is terribly challenging about productivity is that on the other hand there are more and more indicators and now the discussion is clearly emphasized in that direction but at the same time because this is a project funded by Academy on the other hand the leaders of the project, they share a conception according to which one needs to produce scientific articles. And so we have the exact same [consortia name] this, that the amout of scientific articles and impact points and...” (Professor, Interview 11, Q31)

There are differences in how favourable and useful informants saw the activities of outward interaction. Some found them as very exciting and a valuable add to their daily work as well as for their visibility, for instance, through being able to join and give comments in various policy hearings. Increasing professional development was by two post-doctoral researchers suggested as something that has come up with the SRC programme. These two researchers also experienced that through the programme "other work" trajectories outside of academia are easier to reach if the conditions in academia got worse. One post-doc researcher explained that presenting research results to different policy actors and politicians has increased remarkably in comparison to earlier projects, offering new and quite exciting arenas of participation.

> ”But lets say that if one wants to have a societal impact I think that these kinds of programmes in which we are working in, are excellent in that you can in a way participate in politics without being in politics. That you can offer these kinds of scenarios we have seen. Then we can look at them, for instance, from a liberal perspective or, for instance, from a social democratic perspective or from which ever perspective or world view. Then we can come to different conclusions on the basis of the desirability of these scenarios. But the scenarios are here.” (Post-doc researcher, Interview 6, Q32)

A couple of researchers were on the contrary very uncomfortable with communicating on social media and in public, stating that it is not really interesting, natural or pleasurable for them. One senior researcher argued that communicating in common sense is not something that natural scientists in the field are used to and wondered if it was in the first

place more a job of a science popularizer and marketer than researcher since research in itself is already a demanding and time-consuming task. Why a researcher should do everything, the senior researcher asked.

Even when one finds the new tasks and roles enjoyable, it is not however, necessarily something one can do without having enough support and incentives. For instance, a couple of early- stage informants told they enjoy science popularizing and communication activities. At the same time, they were worried about not becoming highly merited as researchers in academia if they were to take up these different tasks actively. As follows, these activities may end up being mere extra work or even a stressful burden for researchers. Finding the tasks enjoyable is not enough when their merited value within the credibility system of academia is rather low.

> ”We were just recently discussing that with a colleague, that like, we discussed the kind of situation that now the publication is lagging behind a bit. But then again one has participated a lot in the kind of societal interaction or that kind of work. But then it is not visible with these indicators in anywhere. So that is very problematic.” (Post-doc researcher, Interview 10, Q33)

In addition to the career phase, also the academic orientation and interests of the researcher may play a part in how much one sees the other activities as either a hindrance or an enabler for career development. Especially when the home or preferred institution (e.g university, Academy of Finland tenure track) expects certain types of academic criteria, it may cause controversy when combined with the SRC programme’s criteria of outwardly interaction, resulting in compatibility issues. Different communities of practice (Bowker & Star 1999) have their own familiar concepts and categories that may also conflict with each other unless modified.

> ”…like to other people, yeah. So does it serve then that, that one would regarding certain Academy’s criteria be a top researcher, that there would be a lot of top-quality publications, so I am not sure whether it is possible to do them both but yeah. In a way I perceive that it is very, this is very kind of interesting and fun and nice being in this kind of...[--] conducting research is nevertheless the interesting [laugh] and so [conducting research and being a part of a big group] but does it serve those, my researcher’s…well of course in researcher’s career nowadays there is of course a lot of these kinds of, that one has to have also other capabilities than this, this, than having the publications. So in that sense it is quite, probably it is quite good to be part of this kind of…Then when it comes to one’s own research, I would imagine that it would be easier to become top quality just by being an independent thinker…” (Post-doc researcher, Interview 4, Q34)

In addition to these activities easily becoming (favorable or unfavorable) extra tasks hindering the progress of scientific articles, especially many of the early-stage researchers

discussed the difficulties regarding lack of skills in communication and translation. They perceived that one really needs to have strong popularization and communication skills in order to succeed in these tasks and that there should be some kind of training for them. Especially when the field of research has a very specific terminology, it may be quite demanding to communicate it in understandable terms for different audiences. One post-doc researcher explained that usually people, who can develop wider framings from which all the partners can find themselves, are more likely to succeed in the programme. In addition according to the researcher having consultants in the programme has helped. Furthermore, curiosity, open-mindedness and the will to believe the good in people were suggested as beneficial qualities within the interaction of the programme. As an act of articulation work (Star & Strauss 1999), one may also start to learn communication skills in one's own time in order to succeed in communication activities better:

> "We wrote a short magazine article [name of the magazine] and it got returned back to us right away from the journalist, that it cannot be written like this and that in press we write results first and to the end some kind of a detail. Whereas as a researcher one has learned that at first the starting points and hypotheses, then in the end results and conclusions, that in press it is the other way around. Then as one has to have gotten into these kinds of…because in a way SRC now demands that this kind of popularized publication has to be conducted then one has had to do it and then one has learned that one can communicate in this way, in a way taking into account the target group. So it has been good to then learn and see that side too." (PhD student, Interview 2, Q35)

Compatibility issues were present in combining programme requirements and diverse backgrounds with varying skills in interacting research results outwardly. In addition, the delegation of tasks and requirements seemed to also vary between career phase and position. In my data, researchers in the beginning of their careers usually discussed themes regarding their career progress, whereas senior researchers and professors also thought about project management issues at a more general level. Especially many of the senior researchers and professors explained that the mid-evaluation of projects' societal and scientific impact was a very intensive process that took a lot of resources and effort and did not seem to pay off.

> "Well that rapporting process, even though as I said I was not involved in that as a central person but that was very tough. That it took a lot of time. Hours and hours were spent on it. That it was in some way, somehow the relation between efficiency and benefit regarding that did not work out.

- Yeah so it did not work out?

> Yeah I cannot say that it would in some way. My own experience is that it did not actualize in there. We did a tremendous amount of work towards it…" (Professor, Interview 7, Q36)

The sudden changes in rules and ambiguity of assessment criteria were seen as challenging and stressful among most of my informants. Pietilä also found that the ambiquity of criteria and unpredictability played a part in her interviewees' experienced frustration within academia (2018, 81-82). Many of the informants explained that the promise of continuity became insecure during mid-term evaluation of the programme. Subsequently many of them had to be prepared to change plans in case the funding would be cut off to "think about alternative futures" (Post-doc researcher, Interview 8) as one of the informants expressed. At the same time researchers spent a lot of time thinking and proofing the worth and impact of their research which took much time away from the actual conduct of research. Many of the infomants perceived that this came far too early on in the research project because it takes time to see the development of the project. A few of the projects experienced cuts on funding and had to change original plans. A couple of the reserve consortium and consortium leaders were very frustrated by this since large projects demand a lot of resources in order to be successful. If cuts are made half way through the project, the initial plans certainly cannot be accomplished.

> "So it is terribly, just as we learned to know each other and it has now, what has been done also is that those work contracts have been cut off terribly. At the beginning the purpose was that they would be long and now they are a month or two, some half a year, like gig-oriented and then it will result in more disunity in there. Yeah and the thing that, and it can be that I am very old-fashioned and represent some confirmed perspectives but I perceive that before moving forward, all the interests, passions, conceptions and basic concepts should have been mapped out at the very beginning." (Professor, Interview 11, Q37)

A coherent coordination and management of programme seems to become crucial when researchers are through vague strategicness, organized inclusion and diversified legitimation, balancing between different commitments in a short time-span. Informants however often said that they understand it is a learning process for everyone since it is a completely new programme. Even though this was mentioned in many of the interviews, informants had usually taken the responsibility of managing everything on their own shoulders. They hence might have an increasing amount of articulation work (Star & Strauss 1999) to take up in the form of self-management of stress as well as dividing time between other work and scientific work. This is highlighted in one consortium leader's interview:

> ”That it was a kind of challenge in a way. Then overall a challenge personally in this SRC-thing is that these are really enormous projects. Plus that expecially those 2015-projects in which SRC also was learning all the time that how is this thing going to be taken care of, so we as first projects were learning…Like in a way one day we got some conception that it will be like this, two months later it was stated that in fact lets do it like this and so…There has been kind of those practicalities, that it has been a bit like this, consortium leaders speak with each other about a human experiment, that let’s see who will survive until the year of 2021 alive, that…so it has been a kind of learning thing…(Professor, Interview 7, Q38)

A lack of time was a visible restrain for many of the participants. Especially the post-doc researchers and a research team leader as well as a consortium leader spoke of a constant time pressure that comes along with all the different tasks. Many of them were very stressed for that their scientific articles will not progress if they participate in all the other work. In addition, aiming at harmonizing different disciplinary approaches and communicating with stakeholders takes a longer time than working with people that come from a very similar background. This issue was also more generally acknowledged by one consortium leader and a team leader who wish they were able to conduct research as that is the thing that inspires and excites them the most, the reason why they in the first place wanted to explore the career. Different managerial tasks, teaching and leading the research do not leave much time for research. A team leader explained that for a long time, working 12 hours a day has not been enough. This might also be a more general trend as Pietilä (2018) also found through her dissertation research on Finnish universities and their tenure track positions that there are tensions among academics in relation to the various demands that should be managed simultaneously. In addition to the more traditional tasks of research and teaching, academics should be successful in coordinating projects, engagement with diverse actors, and gaining leadership positions among other requirements. If academics do not have enough organizational backing, managing all the tasks may end up causing issues in attempts at balancing between the spheres of life and work. (Pietilä 2018, 81-82.)

With regard to supportive factors, interaction coordinators or “knowledge brokers” (e.g. Meyer 2010) were by some of the informants, especially among senior researchers and professors, highlighted as having a very important role in preserving researchers’ valuable time for research. They were also seen to enhance communication and push researchers to be more active outwards. They are persons who support researchers in the interaction activities and facilitate interaction within, between and outwards consortia. They seem to,

based on the experiences of a few informants, have an important role "in the mediation of knowledge" (Star 2010, 605) within the engineered shared space. Some senior researchers and professors highlighted that the person who is in this role has to know the field and all of the stakeholders and actors relevant to the researched issue. They explained that not just anyone with communication skills can work in the position.

> "Yeah. In a way that has been nevertheless the most important employee, that coordinator." (Professor, Interview 7, Q39)

Project management and facilitation skills were also by a few of the early stage researchers mentioned as increasingly important in this kind of a large programme. One post-doc explained that the manager or leader of the group is the one who finds solutions in situations where there are differing views on the processes of research, for instance, between researchers that have diverging epistemic commitments. One PhD student even perceived that the best thing so far in the programme has been their consortium leader: the way one takes into account everyone involved, making sure that all of the participants are on track of things going on in the project.

> "And sure the kind of, nevertheless in these there tend to be rather large consortia and large projects in these searches, so it is very important that the leader of the consortium is the kind of like, most of all a skillful leader and that this could be somehow estimated when the process for applying is on. So then this, not solely, and as he/she is in no way an expert of all the areas of work, to be clear, and he/she has also made it clear…that he/she does not know about our things so much as we know and that he/she knows something of one's own working area but that it is not so important to be able to do all of the things perfectly. Instead that one is able to, understand like, be able to lead and ability to learn then the essentials about it, listen to what kinds of things there are to be said among different people in there. (PhD student, Interview 3, Q40)

Providing support and facilitation seems to be important regarding the mismatches that informants have experienced. A few of the informants suggested that some sort of a connecting or harmonizing system is needed, with regard to the challenges of multidisciplinary collaboration within consortia and in order to enhance mutual learning and discussion. Additionally, a coordinating system between the consortia is suggested, one that could keep researchers aware of what is going on and what everyone is doing to maximize benefits for all without, however, adding more reporting burden for anyone. One senior researcher suggested that it could be very useful to have a person who could go to different organizations, for instance for a month, and attend meetings as well as discuss their project's research and get the message further to the organizations.

5.4. Diversity of extra-academic relations

There were differences in informants' adaptation to the programme also at the level of collaboration with partners outside of academia. These differences indicated that there is a diversity of extra-academic relations within the engineered shared space of SRC. The differences in particular derived from diverging project orientations, partners' backgrounds, academic orientations and interests of researchers.

5.4.1 Working with or without consensus

In the programme, the aim is to solve various problems and contribute to broad aims such as energy transition and enhancement of well-being and equality in society. The focus is hence increasingly on changing things to a certain direction. The differences in relations within extra-academic engagement seemed to particularly be consequences of different project orientations within the programme. Some of the projects are in a way closer to what the groups had done previously, sometimes even with the same partners, making it easier to adapt to familiar ways of working. Others may be trying something quite new, with a greater likelihood of facing obstacles in common understanding. Informants hence needed to practice differential amounts of articulation work due to the varying amounts of mismatches in collaboration.

Some of the informants perceived that collaboration with stakeholders could be a way to direct and enable a more desirable and sustainable societal change and future (e.g. regarding environmental issues and poor decision-making lacking evidence-base). Furthermore, it was explained that if one does not join the discussion and involve stakeholders the development will go in wrong direction.

> ”Mmm in our case, but we have this, in our project the thought is that in order to change [name] markets the companies need to be changed or that the companies need to be involved in that because university cannot decide on that, researchers decide like well you need to do, politicians can neither decide because those build [name of a company] and others build then [laughs]…what one does. So if one is not included it does not matter what one does.” (Post-doc researcher, Interview 4, Q41)

The collaboration was often seen as a way to increase understanding, change thinking both ways. In many cases informants, however, perceived that stakeholders, such as

companies and politicians are actually the ones who benefit the most from the collaboration since researchers give the research results to their use. Extra-academic actors were in many cases explained to be the ones who should change their behavior. Interestingly, some of my informants, through SRC, practiced boundary work (Gieryn 1983) in separating themselves as agents of change, aiming to alter their partners' behavior to a right direction.

> ”Well of course discussion enhances mutual understanding. So probably if we had discussed with Sipilä a little more so then perhaps disgrading comments on docents would not have been expressed. Like clearly some of these decision-makers have a weak understanding of researchers' work and what is being done in research.” (Senior researcher, Interview 1, Q42)

Subsequently, a change in, for instance, the way a stakeholder discusses some issues after a common discussion was seen as a successful outcome of the collaboration. The fact that stakeholders were increasingly realizing that it is important to support, for instance, energy transition or give support and aim to understand scientific research, were also seen as positive outcomes. In addition, stakeholders coming to listen to research results in events organized by researchers, and seeing changes in the way stakeholders later speak or comment on issues that they previously commented in other ways (being now closer to research results) were mentioned as successful results of interaction. There was ambiquity, however, regarding the way in which changes in partners' behavior should be assessed, whether, for instance, a person should go to a given organization and look at how partners make use of their results in their operations. Being able to contribute to the utilization of research results in, for instance, policy processes and structures were seen as examples of successful achievements.

> ”And then, but the kind of successes, maybe I somehow generally perceive that our results have ended up on different decision makers' tables and structures, for example to [an evaluation plan] and elsewhere. So clearly the information that we are producing is being utilized.” (Post-doc researcher, Interview 13, Q43)

Some of my informants told that researchers' visibility had notably increased through the projects and that they had been asked to participate in different hearings to give comments and share their thoughts on different issues. One consortium leader explained that stakeholders have been very excited to gain more awareness and information on researchers and their research projects. They are now also contacting researchers themselves and asking questions on further research projects. It, however, came across that the boundary characteristics that enabled the exchange of thoughts also caused

tensions that derived from dissimilar interests within projects. According to my data there seemed to be more controversy with partners who do not have that much of experience, awareness of or interest towards research processes and results. This indicates that the orientation and background of the partners (e.g. companies, NGO's, start-ups, members of political parties) played a part in the amount of perceived tensions within collaborations. In addition, the shared benefit between projects differs, causing a bigger amount of tensions in some relations than others. Ideological questions and value positions do not necessarily come across as directly in all of the collaborations.

Many of my informants explained that stakeholders may be looking for research results that support their work or interests without aiming to understand research results in a more comprehensive way. In general, informants tended to perceive that they had not discussed the needs, interests and desirable outcomes in a profound way with partners. Assessing change is an ambiguous issue, since participants may not think about the desirable outcome in the same way. Even when engineering a shared space facilitates collaboration, the diverging interests may not necessarily be resolved or discussed openly within the shared space. For instance, mismatches derived from diverging schedules for work between researchers and their partners. It takes time to conduct scientific research and some of the stakeholders wished to gain research results in a very quick timetable. Researchers would, in spite of this, like to take sufficiently into account science's commitments, and their academic community of practice's (Bowker & Star 1999) norms and conventions. Some informants also pointed out that one should rather discuss the current consensus on what is known about the researched issue, not just a few separate research results.

> "But surely there is its own challenge, that knowledge, like producing this kind of scientific knowledge is slow. And then many stakeholders would hope to have the knowledge terribly quickly. And in order for us to be able to conduct high-quality analysis and high-quality research so then of course we cannot progress faster than what we are able to. And, but on the other hand, again I think that researcher's task would be to rapport on, not solely one's own research but also the consensus of research that we do not at the moment, that we have on the basis of other research already have. So basically, in that way have been able to answer to this kind of a contradiction." (Post-doc researcher, 8, Q44)

A senior researcher explained that one governmental stakeholder that they are working with has a very similar kind of work pace, which enables them to forward policy processes together more evenly. In addition, the length of the programme enables them to sustain the collaboration longer, making it possible to have casual discussion and to suggest

things both ways as partners, not just through official presentations. A lack of activity and interest on behalf of stakeholders was a source of frustration for a couple of my informants. One senior researcher argued that being able to get stakeholders' attention is actually the most challenging thing in the whole project. On the other hand, even when stakeholders are active, researchers might need to face an increasing amount of pressures due to mismatches deriving from diverging interests. For example, politicians may want to gain scientific evidence to support certain opinions and themes that one could promote further in parliament.

> "…Our research publication came out. Well it provoked interest because the results were favorable from the perspective of the representives of the governmental parties. They promoted, or in a way it answered to their need, that they got scientific grounding to their arguments. So regarding that they wanted to know something, so then we were able to join some work group discussion on that basis, to present our results, our researcher went there. And then there will of course be follow-up questions, that do we know about this kind of a thing. Well we do not know but with our data we could answer. And those kinds of things may emerge, so basically questions similar to research questions, and if we are able to answer them so then we…if we have time resources we will even perhaps start conducting that kind of research. But once again the process is that…We will not progress in a way in which we would make some analysis paper without then that…" (Professor, Interview 7, Q45)

Mismatches regarding diverging interests within a project may result in feelings opposite to empowerment or self-efficacy. As an example, one PhD student was very disappointed that there had been no visible changes in politics even when they had tried their best and have the best researchers nationally and internationally in the consortium. Often informants explained that a researcher has to be increasingly aware of potential misunderstandings that may occur when they are dealing with research areas that provoke a lot of diverse opinions and emotions. Many of the informants subsequently emphasized that a researcher cannot state what is right and what is wrong but can explain the factors behind a phenomenon. This way one may help to contribute to the understanding of different choices and offer possible scenarios of future outcomes on that basis. Impartiality was highlighted as an important skill that a researcher should master in these situations. In addition, some informants discussed the importance of acknowledging the fact that one may have a bigger responsibility when discussing different issues with stakeholders. In order to alleviate mismatches, participants may hence practice invisible articulation work (Strauss & Star 1999) in the form of enhanced translation and boundary work (Gieryn 1983). This may be the case if there is not enough support or translation tools available.

Many of the informants emphasized that they hope to receive feedback on the relevance of their research from the stakeholders. They were eagerly looking for legitimation for the societal appropriateness of their research, new perspectives, ideas and help in seeing whether researchers have missed something relevant to the issue. For example, in one case a professor from the field of natural sciences said that it was a disappointment that their partners observed that some environmental aspects of their research process had not been taken into account enough during the research process.

> So. Yeah and the more there will be, the better. So, in SRC project if I now understand it correctly it is not so important whether we stay in the original plan if it is going to good direction from the perspectives of these stakeholders. So that it has an impact, so I perceive it is important that we can get feedback and then perhaps redirect these pieces of work and research to the direction that seems to be important." (Professor, Interview 9, Q46)

Ulrike Felt and colleagues in a similar way found some of their interviewed researchers to look for the societal acceptance of stakeholders for their research findings and stakeholders in order to aim at receiving "deeper insights as usual" (Felt et al. 2016, 748-749). Many of my informants explained that stakeholders offer the empirical data for research and researchers then aim to give understanding on what can be done with it, how it can be applied and what kinds of interesting solutions can be produced for the stakeholders through research. One post-doc researcher highlighted that it had so far given more of possibilities than restricted as the companies give data (for instance, of electricity usage) and researchers in return aim to give understanding on how the companies can utilize it. One senior researcher stated that it is also beneficial for stakeholders since corporate social responsibility programmes are nowadays trendy and at least the best companies have them. Through the collaboration companies then participate in common good in addition to being able to further develop products if it seems that it is feasible on the basis of the research. In addition, according to the same researcher one should not be too naïve, but however, think that people in general aim for the good and that companies can also work ethically even when they aim for profit. In a similar way, a couple of other researchers mentioned the will to believe good in people, even if the ways of going towards it may differ, as an important quality that one could have in interaction.

In addition, extra-academic stakeholders' views on the issues were also valued epistemically. Some of the informants explained that the understanding of different

phenomena increases mutually in the common discussions. In these cases, research was seen to become more comprehensive when one gains more awareness of the phenomena also from the side of the stakeholders. Felt and colleagues (2016, 749) also found that the researchers they interviewed saw the knowledge of stakeholders to be beneficial and vital in gaining a more comprehensive understanding of the common issue they are working towards.

> ”And, then from our side I perhaps, what I think that of course partly that, that also in some way, that they often have quite good conceptions that…we just had this kind of advisory board’s meeting and there was this kind of [theme] and then we went through discussion regarding the results with the stakeholders, that what they think about the results and other things. And I think there were really good points from one side to the other. And the kinds of, like people look at it from the side of their own work, the thing that is central here, so also the kinds of things that I had not as a researcher of the [theme] thought about emerged from there. For example, like these kinds of things could be quite central. That in a way, from there is a lot of the kind of competence what I perceive has been in fact quite useful and then of course, we also want to communicate it forward, what we have been conducting research on.” (Post-doc researcher, Interview 8, Q47)

One post-doc researcher mentioned regarding case of company collaboration that companies are in fact now through the collaboration even suggesting new ideas with empirical context and asking whether they would also be interesting for researchers to study. Furthermore, according to the researcher the collaboration works very well when all the partners know the rules, and companies know that researchers are fully funded by the programme. This enables the knowledge exchange in such a way that companies are excited to receive interesting research results that support their work. At the same time researchers will be more included and aware of the different company cases. The companies also need to further offer interesting cases in return since researchers have through the programme a position from where they can choose different cases for research. This resembles a “win-win situation” that Felt and colleagues (2016) found when studying the engagement between scientists and stakeholders. It is characterized as happening through a situational engagement in which both of the parties give something to the collaboration “imagined as not intervening in the core of knowledge production”. (Felt et al. 2016, 747.) Collaboration activities between stakeholders and researchers are for instance workshops in which they discuss the kind of interaction stakeholders are looking for, the results of research, whether there is some feedback for further research and the beneficiality of research for the stakeholders. It seems that policy briefs that researchers write based on their research results are useful in utilizing the results forward.

A steering group was mentioned in many interviews: it is a group of relevant stakeholders that are chosen according to the subject of research.

In spite of everyone aiming for the same vague aim, informants often acknowledged that their subject of research is not always relevant for the stakeholders. Vice versa, the issues that interest stakeholders may not necessarily be of relevance for the researchers. It was found that in some cases, partners who lack resources may start to delegate their organizations' own tasks to researchers who are through the programme more available. For instance, one post-doc researcher explained that their partner asked them to participate in their own reporting work since they did not themselves have enough staff for conducting that work. The work that researchers conduct for stakeholders may become the other work, again additional to their own scientific work, in a similar way as the activities etc. in the previous section. In these cases, the work of different actors is not hybridized but rather becomes the extra work that researchers under collaboration need to take into account.

> "I had perhaps assumed that there would be a little bit more of the kind of peevish attitude, that researchers investigate and we deal with these practical jobs, so there has been less of that nonetheless. [--] Partly this might be affected by the fact that for instance companies, their research and development staff has decreased and more and more of the research and practical development work are within the normal processes and through that perhaps…there is a need for extra help and extra know-how, and these are now accessible through these projects then." (Professor, Interview 14, Q48)

I noticed that some of the informants discussed the need to take balancing acts, as one form of articulation work (Star & Strauss 1999) within collaboration with partners. They hence balanced between the perspectives and needs of stakeholders while at the same time aiming at saving enough time for scientific activities of their own interest. They highlighted that these balancing acts may sometimes be necessary when collaborating within the engineered shared space. When collaboration with partners has a strong legitimation within the programme, is in a way concretized as a standard of working, it may be hard to draw a line or decline the partners' offers that are not part of their own scientific projects. Researchers may also need to make compromises in the language they use when they are collaborating: conceptual nyances that are important in research may not be of relevance in the interaction with stakeholders, or may even become a hindrance.

> "Then if one thinks about researchers, we sometimes tend to express ourselves in a complicated way, and there in someway I conceive that I could myself get better at. That in some way one could communicate those things in a way that many kinds of people could understand the message because they are nevertheless not so complicated things that one could not explain them in an understandable way. But in some way all the conceptual nuances and other things which one would want to hold on to researchwise, then are not necessarily as relevant in the interaction. But sometimes it is just hard to let go of it." (Post doc researcher, Interview 13, Q49)

Even when partners were in this way constructing relevance together, often informants still secured a kind of epistemic authority (Gieryn 1983) for themselves as an academic community of practice. Informants often explained that it is ok for the stakeholders to suggest ideas for research or even propose research questions but a researcher in the end still decides what is worthwhile and relevant to study.

> "Yeah, and I mean that if from the other side of the interaction, from politics or decision-makers or somewhere a question emerges, to which an answer is sought after, then research can aim at answering it, sometimes it might even succeed but it should not be, it cannot be set in stone. Research has to be able to itself determine that is this really, in a way like, do we want to answer to this or not. We may want to answer it if it feels relevant or it may on the other hand give inspiration to investigate something else. Surely it is good if the recipient will get to know something about the subject matter." (PhD student, Interview 2, Q50)

In other words, as an act of articulation work researchers practiced boundary work (Gieryn 1983) in demarcating their position as researchers in relation to stakeholders. Felt and colleagues (2016) also found a similar kind of phenomenon. Even when there was a seemingly equal space of suggesting ideas, academic participants were still strongly defining the direction of the research process and the collaborations were very temporary (Felt et al. 2016, 750-751). Many of my interviewees acknowledged that despite their common aim within SRC, all of the participants still have their interests and needs deriving from their own field of work. The boundary was often maintained between the roles within the collaboration, even though researchers were often very interested in hearing partners' insights on the common issues. Sometimes researchers had even declared the rules of the collaboration upfront to stakeholders from the very beginning of the project.

> "Yeah, yeah and they can, and yeah sure. They can utilize it surely in a way perhaps as marketing support, that this is not, like said, we told the companies already from the beginning that this is not any kind of product testing system because this was not. And that we do not, if we do see something there [sector]

> then it is not due to any single product or due to a single company's product because this is a [model]. So well, yeah one may perhaps easily get a wrong picture of that, that the share of those companies is nevertheless not, as said, money did not move to any direction in there". (Senior researcher, Interview 5, Q51)

Even when researchers were demarcating science as something that a researcher strongly decides on or has autonomy on, they could in a contradictory way, also discuss research under the SRC programme as something that is "determined from the outside", "researchers being slaved by upper aims" and "researchers being forced to be interactive". Researchers practiced varying amounts of articulation work (Star & Strauss 1999) when there was no consensus but co-operation still continued. The naturalization (Bowker & Star 1999) of collaboration as a standard of strategic research may take its embodiment in very diverse ways. It thus seems that strategic research takes multiple forms depending on the project orientation and its shared benefit as well as the collaborating partners.

6. Conclusions

In the beginning of the thesis, in the light of previous research (e.g. Möllers 2017; Thompson et al. 2017; Felt et al. 2016), I suggested that it is important to study new research programmes that address the global science policy trends of recent years (e.g. Molas-Gallart 2015; Pielke 2012; Rask 2018) in order to gain a better understanding of the phenomenon in its local contexts. As an example of these trends in Finland, I studied the SRC programme that has been engineered as a shared space through certain common requirements and criteria. Hearing participants' perspectives assists in understanding the dynamics and relations of an institution and its contruction beyond programme descriptions. By interviewing researchers of diverse backgrounds, I shed light on the similarities and differences in participants' adaptation to the SRC programme. By studying the characteristics of strategic research "at work", the thesis aimed at gaining perspective to some of the current changes in research environment.

Jane Calvert found basic research to be "a flexible repertoire of characteristics that can be drawn on selectively by scientists and policy makers in a variety of contexts to protect their interests" (2006, 199-200). I argue that strategic research is also, due to the flexibility around its characteristics adaptable to various purposes, activities and motivations in different situations. Similar to other vague science policy concepts (Cairns & Krzywoszynska 2016; Vincent 2014; Miettinen 2002), interpretive flexibility (Star 2010, 601) of strategic research assisted in legitimating the inclusion and co-existence of

different activities and backgrounds. Interesting is, that also the social-epistemic functions of transdiscursive terms that Miettinen (2002) addresses, such as the National Innovation System (NIS), were also to be found in the case of strategic research. In the light of my data, it may be argued that the SRC programme was both flexible and inflexible to the informational requirements (Bowker & Star 1999, 297) of the participants whom I interviewed. Hence, even though informants were able to apply and tailor the characteristics of strategic research for various purposes, some of them faced more mismatches during the course of the project. These tensions were, in particular, consequences of compatibility issues regarding the ways in which strategic research's characteristics concretized in practice.

Prominent characteristics of the engineered shared space of SRC – vague strategicness, diversified legitimation and organized inclusion – enabled the programme to function as a boundary object (Star & Griesemer 1989) in facilitation of communication between diverse communities of practice (Bowker & Star 1999). The maintenance of traditional scientific requirements in addition to the new interaction requirements gave legitimacy and credibility regarding various aspects. Strategic research provided justification, for example, regarding academic relevance, inclusion of dissimilar actors and activities, working in between different organizations, access to resources and visibility. For some it also enhanced strong feelings of empowerement regarding participation in societal change, which is similar to the findings of Thompson and colleagues (2017) on a transdisciplinary programme as well as Rask and colleagues (2018) on participatory research projects.

Broad research themes and problems enabled all the participants to tailor (Calvert 2006) their subject of research as part of the strategic research framing quite easily, allowing for an inclusion of diverse approaches. Participants could also continue working on the exact same thing as they had before joining the programme. Calvert has suggested this might be the case also with the concept of grand challenges (2013, 475-476). For some of the participants from the characteristically more applied backgrounds, the problems seemed to, however, be even more well -fitted (see also Möllers 2017) than for others. In contrast to Calvert's findings on basic research (2006), my informants did not discuss making their research seem more applied but rather the flexibility they had in choosing the approach within the broad theme. Participants whose scientific problems suited the themes very well did not necessarily even need to try to make their work appear more "strategic". Overall, I found that informants did not have to compromise on their own subject of

research since they could quite easily fit it under the new framing within their research groups. This finding is similar to earlier findings on new programmes and pressures (Möllers 2017; Calvert 2006). Strategic research was hence used for boundary work (Gieryn 1983) as informants separated their work as something that still fully takes into account science's own commitments despite the increasing accountability pressures on behalf of the government. These findings indicate that even though there is an increasing amount of external framing within agendas (Molas-Gallart 2015; Pielke 2012), it does not necessarily always mean that scientists had less agency when working under the framings, at least if the framings remain vague enough.

Organized inclusion (e.g. through participant requirements, consortia size, interaction plans) among the other characteristics facilitated communication between actors that have not necessarily collaborated before the project. According to my informants, encounters with different actors increased their awareness of diversity in thinking, working and discussing. In addition, increased communication enhanced their understanding of common problems and phenomena in their multifacetedness. This is similar to the findings of DeHart (2017) and Thompson and colleagues (2017). In some cases, facilitation of encounters also resulted in new, additional cross-disciplinary or cross-sectoral projects and trials as well as closer dialogue between consortia partners and scientists from different disciplines.

In the light of my data, the flexible characteristics of strategic research, however, also resulted in inflexible outcomes that were not equally suitable or favorable for all the participants. In previous research it has been found that new collaborative programmes may contain several tensions that participants need to balance due to dissimilar commitments (Crona & Parker 2012; Wehrens and colleagues 2013). Findings of this thesis also suggest that this was the case in the context of the SRC programme. Interesting is, that not all of the informants faced nearly as much tensions as others: for some the programme represented a rather tension-free and familiar place of working. There were, consequently, at times notable differences in participants' adaptation to the programme. This new finding highlights that participants of dissimilar backgrounds may need to practice diverging amounts of articulation work (Star & Strauss 1999, Strauss 1985) in order to manage their participation within spaces that are engineered through certain common requirements. In my data, this informal balancing work took different forms: for example, as boundary work (Gieryn 1983), tailoring (Calvert 2006), self-management of stress and anxiety, practicing new skills in one's own time, dividing time between other

work and scientific work, distancing oneself of the project objectives and suggesting new openings. Here, the characteristics that enabled the programme to function as a boundary object, were not sufficient in managing the diversity that the programme legitimates.

Hence, I argue that some of the participants' memberships (Bowker & Star 1999) were more compatible with the ways in which work was organized in the programme. This was in particular due to the hegemony in naturalization (Bowker & Star 1999) of complex concepts and objects at the collective collaboration level. In other words, for example, some conceptions of scientific quality, interaction and impact gained a neutral, a standard-like position more easily than others. As follows, some informants faced more tensions at the level of cross-disciplinary collaboration, others in handling the new tasks, roles and requirements or managing relations in extra-academic engagement. According to my data these differences were in particular consequences of researchers' academic orientation and interests, differential project orientations within the programme, partner or home institution's orientations and interests, career phase and position as well as power asymmetries. Even though all of the participants were able study the subject of their interest within the programme through the aforementioned flexible characteristics, not all had the experience of being able to contribute to the common practical problems equally. This finding suggests that similarly to research environment changes and subsequent polarization among academics (e.g. Ylijoki & Ursin 2013; Smiths 2012), polarization may also occur within new transdisciplinary programmes and schemes. This also raises questions on potential academic segregation within large top-down-driven programmes.

Regarding cross-disciplinary research collaboration, I found that actually integrating the different disciplinary approaches in practice may be challenging and does not necessarily lead to hybridization of approaches. It seems like in some cases there might even be smaller academic communities working within large transdisciplinary projects. According to my data, incohesion in cross-disciplinary interaction and integration occured especially due to different epistemic and organizational interests and commitments, attitudes, power asymmetries, lack of resources and reflexive discussion as well as common tools and places for addressing philosophical, methodological and theoretical commitments. Similar to what Dana DeHart (2016, 462-463) found, also some of my informants addressed the importance of knowing the collaborating partners and scientists beforehand in order to make the collaborations work within a short period of time. This in turn might have a narrowing effect on participation, if eligible participants

are chosen very carefully based on their suitability to a given task. For some the programme hence resembled a stronger feeling of being "at home" while for others it introduced more controversies. Star (2010) addresses this co-existence of experiences and interpretations common for boundary objects: "Such maps may resemble each other, overlap, and even seem indistinguishable to an outsider's eye. Their difference depends on the use and interpretation of the object. One group's pleasant camping spot is another's source of data about speciation (Star 2010, 602)." Moreover, even when there is "a shared epistemic territory" (Felt et al. 2016, 750) it does not automatically indicate that all the actors can acquire an equal standing in that territory.

The more experienced informants familiar with Tekes and State research institutes' projects perceived that the project was very similar to their previous projects. With regard to recent changes in the Finnish funding environment this finding indicates that the more "applied research" -oriented organizations that have experienced notable funding cuts in recent years (SVT 2018; OECD 2017) may perhaps continue to conduct similar kind of research now under Academy of Finland's strategic research framing. In the light of my data, it seems that research funded by Tekes and state research institutes have through the SRC programme become part of Academy of Finland's projects more visibly. Even though Academy of Finland has been granted more funding in recent years (SVT 2018; OECD 2017, it appears that the SRC programme might differ from the other programmes it coordinates. In the SRC consortia there are now participants coming from a larger variety of organizational backgrounds influencing the inner dynamics and co-framing of the projects. This feeling of being at home was not there in the same way for two experienced researchers with much Academy of Finland funding experience from social sciences and humanities backgrounds. Even though they were able to suit their subject of research as part of the strategic framing within their own research groups, they experienced having been left out at the collective level. Moreover, the concepts of impact and interaction were in the collaboration concretized more strongly according to epistemic discourses that are charasterically seen as more applied. It appears that the positions in co-framing of problems and solutions were not equal within the collaboration. As a result, the informants who experienced these tensions, practiced a considerable amount of articulation work (Strauss & Star 1999) in managing their participation. Research conducted under different funding institutions and organizations despite their similarities vary in their emphasis areas with all generating a diversity of societal impact. Tekes and state research institutes have already been in closer connection with for

example ministries and companies prior to the SRC programme (Late & Puuska 2014), and may on that basis perhaps more easily gain a hegemonic position in naturalization (Bowker & Star 1999) of the concepts of interaction and impact.

This indicates that better acknowledgement of the diversity regarding societal impact of research is important, because, according to my data certain categorizations, such as, "basic research", "university research" and "bottom-up research" had to be justified more for their societal relevance and impact in the collaboration. Categorizations of basic and applied research were hence still playing a strong role as powerful organizing tools (see Tuunainen & Miettinen 2010; Pielke 2012; Calvert 2006) when participants described the nature of strategic research. Impact of science happens on various ways in spite of the organization, field of research and discipline (see e.g. Mustajoki 2017; Koskinen 2016; Väliverronen 2016, 104-105). If the impact of science is narrowed down into certain standard charasteristics then in the current funding environment's emphasis on societal impact much research would problematically not be seen as relevant. This also relates to the discussion that Tarja Knuuttila (2013) addresses with regard to relevance, addressing the claims on the shift from Mode 1 to Mode 2 knowledge. Classifying for instance theoretical work as something that is only describing the world is problematic since theories and theoretical models do not only describe and analyze the world but also shape it (Knuuttila 2013, 2447-2449). Miettinen and colleagues (2015) address that the relationship between problem solving and theory work is continuous and interactive and may actualize in different ways. Moreover, "representing and intervening seem to feed on one another" (Knuuttila 2013, 2447). Increasing the understanding of a phenomenon is vital for enhancing the likelihood of solving different societal issues (Miettinen et al. 2015).

If the framing becomes narrower then also tailoring one's subject area as strategic might become more difficult for researchers who have an alternative strategic take on the studied issue. Discourses of which outcomes are more easily utilized commercially or quantitatively as well as are more readily fitted to the practical problems may start to "own" the problem, shifting collaboration to "disciplinary capture" (Brister 2016). If some voices become silent in the collective problem-soving level, it might at worst have a narrowing effect on the actual societal impact of science in our society. As Michel Foucault states: "The exercise of power itself creates and causes to emerge new objects of knowledge and accumulates new bodies of information" (1980, 51). The outcome of

strategic research depends on the relations that shape the solutions to a given problem. Hence, the dynamics of the relations matter, creating reality. Mere inclusion of diverse disciplinary approaches into an engineered shared space may not automatically alleviate inner exclusion. Boundary objects are hence not free of power asymmetries (Huvila 2011). In the light of my study, it is thus in particular important to pay attention to the risk of "pseudo-integration" which Inkeri Koskinen and Uskali Mäki (2016) discuss in relation to issues of integration within transdisciplinary programmes. According to them, an equal integration may be a very challenging or sometimes even an unrealistic aim between disciplines of very diverging approaches. Especially when integration is expected to happen in a very short-time span with the help of vague boundary objects, there may sometimes be a risk of decreasing reliability regarding research outcomes. (Koskinen & Mäki 2016, 433, 441.)

Lack of interaction was also present in the experiences of early stage researchers. Many of them felt that they were not part of all the interaction and impact aspects within the programme in a same way as the senior researchers and the lead of the programme. Even though generally the early stage researchers perceived the project to be very interdisciplinary, they explained that their own piece of work was still done very individually. They also spoke that collaboration happened mostly within their own research groups, indicating to remaining in silos within the programme. These experiences were interestingly opposite to what Kirsi Pulkkinen and Timo Aarrevaara (2016) found through analyzing the SRC interaction plans and discussions with project responsibles. They found interaction to be an encompassing feature of being a researcher in the programme. My finding resembles what Felt and colleagues (2013) found on early stage researchers' socialization in programmes with transdisciplinary ideology. Could it be so that the delegation of responsibilities and interaction is divided strongly through career phases and positions, passing through different hubs, and leaving the across and bottom-up interaction narrow? Expectations may also play a role in how the programme is perceived by participants of different positions. It is also important to notify that this finding was done with a very small sample of informants and would need further investigation to be elaborated more.

Regarding collaboration with extra-academic partners, it also came across that changes in knowledge production and role divisions might not be as profound as proposed (e.g. Nowotny 2003, Gibbons et al. 1994) even when communication has increased and there

is surely interest to collaborate both ways between extra-academic actors and scientists. This finding is in line with the findings of Felt (2016), Knuuttila & Tuunainen (2009), Hakala & Ylijoki (2001) and Tuunainen (2005). Overall, differences between informants' perceptions of collaboration showed that due to project orientations and prior professional background, it is for some researchers in any case, depending on one's field of research and home organization, very familiar to collaborate closely with, for instance, companies and NGO's among other communities. Collaboration was thus not necessarily anything that new nor controversy provoking. For instance, this was the case in one project where participants were collaborating to build marine related tools. At the same time, depending on the partners' orientation and interests as well as shared benefit within the collaboration, some of the informants faced more tensions. These tensions derived especially from dissimilar time-spans of work, community norms for work, organizational interests, translation issues and value as well as epistemic differences.

Articulation work (Star & Strauss 1999) occurred in the form of boundary work (Gieryn 1983) when, for example, stakeholders needed to receive results in a very quick schedule but researchers could not fasten their academic working process and ignore the commitments of their academic community. Some of the informants were very motivated to alter their partners' ways of working through SRC programme's collaboration, practicing boundary work (Gieryn 1983) as societal change agents. They were motivated when scientific results had been utilized or there was a change, for example, in stakeholders' way of speaking. These findings relate to the idea of scientists gaining a more prominent position in "sustainability governance" (Van Der Hel & Biermann 2017). Many of the informants were also eager to hear partners' insights to the issues, increasing informants' epistemic understanding of the studied phenomena. In this way, they were collaborating for common benefit and societal relevance, increasing epistemic understanding both ways by sharing data and observations. Informants could also discuss research questions and compositions with their partners and get new ideas from those discussions. When comparing my interviews to previous research on university groups participating in business activities (Tuunainen 2005, Knuuttila & Tuunainen 2009), administrative tensions such as ownership issues, did not come across as strongly in the discussions on the SRC collaborations. It would, hence, be interesting to know more about the administrative management of collaborations in the SRC programmes, since the regulations between participating organizations' may vary quite notably. Sometimes informants would explain that, despite common utilization of empirical data, money has

not been exchanged between the partners, which helps them to sustain the autonomy of their research.

Regardless, the informants still often practiced boundary work: Firstly, regarding roles in the collaboration as informants explained that partners are not either interfering with their scientific conduct or that their roles are clearly distinguishable. Secondly, in demarcations between their own scientific work and other work that they contributed to their partners. Notable is also that since collaboration was concretized as a standard, some of the informants had started to receive tasks from their partner organizations. These organizations did not have enough resources for their own tasks and, subsequently, they were then delegated to researchers who were available through the programme. As a result, a couple of informants spoke about having to balance in between their partners' other work and their own scientific work. This kind of articulation work resembles the balancing that other authors have also found (Hakala & Ylijoki 2001; Felt 2016; Wehrens et al. 2013) in relation to projects that are laden with different commitments. It is also possible here that disciplinary capture (Brister 2016) occurs if power positions are not addressed enough within the shared space, shifting the objective of collaboration more strongly to a single direction. In some cases, for example, when politicians aimed at cherry-picking results for decision-making, informants had to practice an increasing amount of articulation work (Star & Strauss1999) as they aimed at keeping their impartiality and autonomy within collaboration. If the informants did not see the results having any effect on decision-making, it in some cases resulted in feelings of frustration.

Naturalization (Bowker & Star 1999) of interaction and impact as the third mission of science, distinguished from epistemic missions (Miettinen et al. 2015) within the SRC programme also brought along another type of "other work" and participation opportunities seen as additional to science. In previous research, it has been found that quality indicators may have perfomative consequences in the work of researchers (Weingart 2005; Butler 2003; Bornmann 2011). According to my data, the quantitative societal impact indicators of the SRC programme were performative in that many of my informants had started to increasingly think about and reproduce them through their work. It appears that regardless of whether one finds the different activities (e.g. blog writing, social media usage, popularized communication, societal impact rapporting) and roles (e.g. scientific advisor in advisory boards) as pleasurable, motivating and interesting or not, there were mismatches regarding lack of resources, skills, and institutional incentives

for practicing them actively. As many authors (e.g. Pietilä 2018; Aarrevaara & Dobson 2015) have discussed with regard to academics' increasing pressures and balancing in between different tasks, it seems that even more additional tasks are now introduced to researchers through the requirement of interaction and impact. This finding is also in line with the findings of Aarrevaara and Pulkkinen (2016) on the interaction within the SRC programmes, as they observed there to be an increasing amount of facilitative and coordinating tasks that researchers were practicing.

As it has been found (Hakala 2009), academics may have to balance or choose between the other work and scientific work, since they may be conflicting regarding academic career development. Academic credibility systems do not see, for instance, science popularizing or speaking in advisory boards as an academic merit. Accordingly, if the tasks are to become more inherently a part of one's career development as a researcher, organizations outside of the programme should then also offer incentives for developing these skills. Several authors have pointed out the need for flexibility outside and within new programmes (e.g. Felt 2016; Thompson 2017). In addition, facilitation of support in terms of training came across as important in order to be successful in the tasks (e.g. science popularizing, public speaking and communication with stakeholders) since this work might be something new for many scientists.Without enough support, they may cause tensions in attempts of balancing the spheres of work and life since "the more communities of practice one participates in, the more the overhead" (Bowker & Star 1999, 309), in other words, more expectations and roles to manage. Moreover, the amount of articulation work (Star & Strauss 1999) participants need to practice within collaboration may become burdensome if it remains invisible.

Lack of time being a considerable concern, it was found that especially among early stage researchers and the more experienced scientists there was a considerable amount of stress and pressure. This has also been found in other studies on academics' work realities in changing science policy conditions (Pietilä 2018; Aarrevaara & Dobson 2015). Coherent coordination and management of large programmes becomes vital when participants try to handle different commitments at the same time. For instance, Maria Pietilä (2018) also found that the changes in performance criteria caused anxiety among academics. Also according to my study, sudden changes in funding and assessment criteria took away a considerable time away from the actual conduct of science. Thus, it seems important to think about the time participants need to spend on other work in comparison to research.

In addition, even though outward interaction is also a very valuable part of interaction and impact work, solely concentrating on that may risk leaving other forms of societal impact and interaction of science unnoticed or undeveloped. For instance, according to the data, engagements between scientists or partners outside of academia, at the level of understanding and creating cross-disciplinary solutions to different problems may need attention. This relates to "the epistemological dimension" of societal impact that Miettinen and colleagues (2015) discuss.

Boundary objects are in a process through which different alternatives are suggested, accepted, contested as well as rejected. Boundary object as an "object of development and design" (Star and Bowker 2002, 233) may later through standardization become stabilized as a part of infrastructure, losing the quality of interpretive flexibility (Star 2010, 601) in the form of certain conceptions, methods and ways of working (Steger et. al 2018). I suggest that the tensions in my data derived from this contestation between the more flexible and rigid forms of the engineered shared space. The need to sustain enough inner flexibility regarding boundary objects has been acknowledged by other authors as well (e.g. Steger et al. 2018, Saarela & Rinne 2016; Huvila 2011). Inflexibility in terms of vague concepts, such as impact, interaction and scientific quality, may through one-sided naturalization lead to standardization that excludes alternative approaches, making them the "residual categories" (Bowker & Star 1999), the so-called anomalies of infrastructure. In relation to pluralization of discourses in science and technology policy (Kaldewey & Flink 2018) there is also a risk that some of the new framings leave out approaches, for example, disciplines that are not seen to contribute to the common problems. At the same time, according to my data it seemed that the vagueness of new framings allows for an inclusion of very diverse approaches.

Overall, importance of methodological, conceptual and philosophical translation tools in addressing the different commitments comes across as important from the many examples regarding collaboration. Knowledge brokers (Meyer 2010) were also seen as valuable in mediating the communication between and across communities. At the same time across and bottom-up interaction between researchers, partners and managers can end up being scarce if there are many hubs or managing in between as was the experience of some early stage researchers within the programme. Many of the informants furthermore argued that in the end, usually the best way to learn new things and understand each other better are through situations where participants actually get to discuss the common topics with each

other face to face. In spite of tensions, all of the informants had been very satisfied to hear a wider array of perspectives and discussions through the engineered shared space. Programmes combining different backgrounds and commitments perhaps need flexible enough mediation that allows for errors and trials as well as support in alleviating minsunderstandings across the communities.

Several authors (Balmer et al. 2015; Owen et al. 2012) have addressed the importance of collective reflexivity, as well as "opening up discussions of unshared goals", "taking risks" and "collective experimentation" (Balmer et al. 2015, 19) within new collaborations. In order to alleviate mismatches, I also suggest that the diverging amounts of participants' articulation work (Star & Strauss 1999) could be made more visible. Tensions may in this way be sources of collective learning. Evelyn Brister (2016) has suggested that it "requires that collaborators craft research questions and innovate research designs which are different from the inherited epistemological frameworks of contributing disciplines." On the basis of my findings this may be important within engineered shared spaces that can enable, enhance, challenge and restrict different ways of thinking and working.

Boundary object (Star & Griesemer 1989) and articulation work (Star & Strauss 1999) among technical concepts of naturalization and communities of practice (Bowker & Star 1999) assisted me in conceptualizing my findings and moving from individual experiences into something more general. I saw it as beneficial that the concepts did not entail a theory to be verified since it did not restrict the things that I could find in the data. They rather increased the possible options for interpretation, which I, however, also found to be challenging. In a way, the SRC programme entails many boundary objects (e.g. strategic problems, tools, concepts) that could also be analyzed separately through ethnographic research. There are also several limitations to the thesis that are important to discuss. My data sample represents only a small amount of researchers within the SRC programme. For instance, I could see visible clusters from the data but a more elaborate comparative analysis would require an inclusion of a larger amount of informants. In addition, including an even more balanced sample of organizational backgrounds would enhance the analysis further. It is also good to keep in mind that perceptions may naturally vary depending on the project and its dynamics, which may affect the research results. My informants as academic participants, all in all, represented solely one side to the phenomenon. In this thesis, the main aim was to shed light on the diversity of participants'

experiences, and the ways in which they interact with the charasteristics of strategic research "at work". For this purpose, the data sample was sufficient.

With regard to further research questions, it would be interesting to hear about the perceptions and experiences of other participants, such as policy makers, stakeholders and funders of the programme to gain a wider understanding of the phenomenon. In addition, it would be interesting to interview a larger amount of participating researchers, and to see how informants' perceptions and experiences change over time as the projects progress forward. The findings regarding the issues of interaction, integration, and disciplinary capture (Brister 2016) provoked further questions on the co-framing of research problems and solutions in new collaborative programmes. Moreover, how different boundary objects within interdisciplinary collaboration are shared, and how interaction is developed within a project that involves participants of diverse backgrounds with various social-epistemic commitments.

7. References

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Appendix 1

Interview questions in English and Finnish:

In the beginning of the interview I asked generally about one's career as a researcher, the kinds of projects one has been working in and about one's current work place.

1. What led you to participate in this research programme and what are your main tasks as a researcher in the SRC-consortium?

2. What kinds of things do you find as meaningful, desirable and worth aiming for as a researcher? What about in the SRC- project?

3. Do you feel that these aforementioned things and aims are in line with the other actors involved?

4. Do you feel that you can actualize these things in a desirable way through your work in the project?

5. Do you see that the interaction has increased through this programme in some significant way? How does the SRC-programme and the interaction between different actors change the nature of research and your role as a researcher?

6. What kind of role does your knowledge, skills and background play in the programme? In relation to other consortia members and interaction partners?

7. Do you believe that through the work you do and through increased interaction activities there will be more profound societal impacts or can you already observe them? (Why and how?)

8. How well do your habits suit with the other actors' habits and structures? (within the consortia and in relation to interaction partners)

9. Can you mention some general skills or ability that are valuable for researcher in this kind of a project? What about other members of consortia and the stakeholders?

10. What kinds of things do you expect from the interaction and what kinds of things are expected of researchers within interaction on behalf of the stakeholders?

11. What are the most difficult challenges and greatest achievements or opportunities that you would like to mention?

12. What kinds of expectations did you have of the project and how have they actualized?

13. Have there appeared new ways of interaction that have increased certain impacts?

14. How could one reach the aims of the consortia (or researcher, mentioned in the beginning of the interview) even better?

15. Are there any visible structures or factors that slow the process of achieving desirable outcomes?

16. What do you think of the discussion on politicization and, on the other hand, on the autonomy of science? What about measuring the level of impact in addition to scientific quality, do you think it is possible or relevant to do it?

17. How do you see your career as a researcher in the future (5 years ahead), what would be an ideal situation?

18. Is there anything else you would like to add or mention? For instance, something surprising you were not expecting?

1. Mikä sai sinut lähtemään mukaan tähän tutkimushankkeeseen ja mitkä ovat pääasialliset tehtäväsi tutkijana STN- konsortiossa?

2. Minkälaisia asioita tavoittelet/ mikä on merkityksellistä ja motivoi sinua eniten tutkijana? Entä työssäsi tutkijana STN- hankkeessa?

3. Koetko, että nämä mainitsemasi tavoitteet ja asiat ovat linjassa STN: n ja muiden mukana olevien toimijoiden tavotteiden kanssa?

4. Koetko pystyväsi vaikuttamaan näihin asioihin haluamallasi tavalla projektissa?

5. Onko vuorovaikutus mielestäsi lisääntynyt ohjelman kautta? Kuinka STN-ohjelma ja eri toimijoiden välinen vuorovaikutus muuttavat mielestäsi tutkimusta ja tutkijan roolia?

6. Minkälainen rooli sinun tiedoillasi, taidoillasi ja taustallasi on hankkeessa? Suhteessa muihin konsortion jäseniin ja vuorovaikutuskumppaneihin?

7. Uskotko, että tekemälläsi työllä ja lisääntyneellä vuorovaikutuksella on vaikutusta tavoitteiden saavuttamisessa, että tutkimusta tullaan hyödyntämään ja vaikutuksia näkyy laajemmin yhteiskunnassa? (Miksi & millä tavoin?)

8. Miten hyvin sinun toimintatapasi sopivat mielestäsi mukana olevien toimijoiden olemassa oleviin toimintatapoihin ja –rakenteisiin? (konsortion sisällä ja suhteessa sidosryhmiin)

9. Mikä on pääasiallinen osaaminen, jota tutkijalla olisi hyvä olla STN-projektissa/vuorovaikutuksessa? Entä minkälaista osaamista muilla konsortion jäsenillä ja sidosryhmillä olisi mielestäsi hyvä olla?

10. Mitä asioita ajattelet vuorovaikutuksen tuovan ja minkälaisia asioita vuorovaikutuskumppanit mahdollisesti odottavat tutkijalta?

11. Mitä merkittävimpiä haasteita tai onnistumisia haluaisit mainita?

12. Minkälaisia odotuksia sinulla oli hankkeesta ja miten odotukset ovat toteutuneet?

13. Onko STN- hankkeen kautta syntynyt uusia vuorovaikutuksen muotoja tai tapoja, jotka lisäävät vaikuttavuutta?

14. Millä tavoin alussa kuvaamiisi tavoitteisiin voisi vielä paremmin päästä?

15. Onko toimintaympäristössä joitain hidastavia tai estäviä tekijöitä suhteessa mainitsemiisi tavoitteisiin?

16. Mitä olet mieltä tieteen politisoitumiskeskustelusta, tai toisaalta tieteen autonomiaan liittyen? Entä vaikuttavuuden mittaaminen tieteellisen laadun mittaamisen lisäksi, onko sitä mahdollista tai relevanttia harjoittaa?

17. Miten näet urasi tutkijana tulevaisuutta ajatellen (5 vuotta eteenpäin), mikä olisi ideaali tilanne?

18. Olisiko vielä jotain muuta mitä sinusta olisi tärkeää sanoa? (esimerkiksi jotain yllättävää, mitä et osannut odottaa)

Appendix 2

Indicators for impact:

Hankkeen tiedot	
STN-ohjelma:	
Hankkeen nimi:	
Konsortion johtaja:	
Yhteystiedot:	
Raportointiväli:	05/2015-06/2017

Ohjeistus

Tämän excel-taulukon avulla on tarkoitus kerätä ainoastaan numeerista tietoa. Tarvittaessa täydentäviä tietoja voi lisätä jokaisen taulukon alapuolelle. Jokainen indikaattori, paitsi indikaattorit 14-18, on vatt omalla lehdellään. Taulukkoja tulee päivittää kumuloitavasti ja pitää tieto ajan tasalla. Taulukkojen data tullaan analysoimaan viimeistään väliarvioinnin yhteydessä, kesällä 2017.

Lista kerättävistä tuotosindikaattoreista, jotka merkitään seuraavilla välilehdillä oleviin taulukoihin:

1. Tieteelliset tuotosindikaattorit

Lyhenne	Indikaattori	Esimerkki/Lisätietoa
Julkaisut	1) Tieteelliset julkaisut	Tutkimusorganisaatioiden tiedonkeruu julkaisuluokittelun mukaisesti. Julkaisuista annetaan koko tiedot, jotta niitä voidaan analysoida
Avoin	2) Avoin tiede	Avoimesti saatavilla olevien tieteellisten julkaisujen ja avattujen tutkimusaineistojen käyttömäärät, ml. lisensioitujen avattujen datojen määrä
Yht.työ julkaisut	3) Julkaisujen muutosten seuranta	Monialaisena/poikkitieteellisenä yhteistyönä kansainvälisetjakotimaiset akateemiset julkaisut.
Vierailut	4) Kansainvälinen tutkijanvaihto	Yliopistojen rahoitusmallin mukainen tietojenkeräys, ml. mahdolliset muutokset 2017 alkaen
Opetus	5) Tutkimustulosten hyödyntäminen opetuksessa	Järjestetyt kurssit/seminaarit, opinnäytteet (pro gradut), tohtorin tutkinnot.
Kv-haut	6) Konsortion jäsen tutkijoiden tekemät kansainväliset rahoitushakemukset	Aihe, koordinaattori, rahoittaja, rahoituksen suuruus, läpimenoprosentti

2. Suunnitelmallinen sidosryhmätyö

Esitykset	7) Esitykset sidosryhmille	Esitysten määrä, osallistujien määrä
Tapahtumat	8) Konsortion järjestämät tapahtumat	Tapahtumien määrä, osallistujien määrä
Komiteat	9) Osallistuminen komiteoiden, toimikuntien ja työryhmien työhön (myös yritysten), kuuleminen eduskunnassa, lausuntopyynnöt	Komitean/toimikunnan/työryhmän nimi, osallistumisen pituus, työpanos

3. Vuorovaikutukseen liittyvät ja taloudelliset tuotosindikaattorit

Yl.tajuiset	10) Yleistajuiset julkaisut	Tutkimusorganisaation tiedonkeruu julkaisuluokittelun mukaisesti
Puheenvuorot	11) Kutsutut puheenvuorot ja muut esiintymiset	Julkiset esiintymiset/luennot/toimiminen kutsuttuna asiantuntijana/TV/radio
Some	12) Sosiaalisen median tavoittavuus	Twitter/LinkedIn/Facebook/verkkosivut: seuraajamäärät
Laaja yleisö	13) Laajalle yleisölle järjestetyt kansainväliset, kansallisetja alueelliset tapahtumat	Tapahtumien määrä, osallistujien määrä
Talous	14) Keksintöilmoitukset	Lukumäärä
	15) Patentit	Lukumäärä
	16) Lisenssit	Lukumäärä
	17) Spin-offs	Lukumäärä
	18) Start-ups	Lukumäärä
	19) Syntyneet tekijänoikeudet	Lukumäärä
	20) Mallioikeudet	Lukumäärä
	21) Hyödyllisyysmallit	Lukumäärä

Appendix 3

Narratives for societal and economic impact:

STN - konsortiohankkeen yhteiskunnallinen ja taloudellinen vaikuttavuus

OTSIKKO (hankkeen tavoite X)

Hankkeen nimi ja lyhenne:
Konsortiojohtaja:
Mihin ohjelmakysymyksiin (A, B, C, D) vastataan?
1. Vaikuttavuustavoite Konsortio määrittelee hankkeen keskeiset (3-n kpl) vaikuttavuustavoitteet, joista kustakin laaditaan oma tarinansa. Mitä vaikuttavuustavoitetta tässä tarkastellaan? Mikä on tarkastelutaso? Tässä esitetään lyhyt kuvaus tavoitteen tutkimuksellisesta ja yhteiskunnallisesta taustasta.
2. Keinot Tässä kerrotaan niistä toimenpiteistä, joita on toteutettu vaikuttavuustavoitteen saavuttamiseksi. Keinoja voivat olla esimerkiksi, uudet menetelmät, uudet kokoonpanot, monitieteisyys, kokeilu, vuorovaikutus, osallistuminen, tapahtumat, esiintymiset, opetus, asiantuntijatehtävät, kansainvälinen yhteistyö, yrityspilotit, patentit, keksintö-ilmoitukset, alustat, portaalit, pelit, jne.
3. Vaikutukset Tässä kuvataan hankkeen konkreettisia vaikutuksia. Niitä voivat olla esimerkiksi uudet näkemykset, julkinen keskustelu (ml. some), muutokset toiminnassa, käyttäytymisessä tai intresseissä, vaikutukset lainvalmisteluun tai strategioihin, uudet opetussisällöt, liiketoimintamallit, tuotteet, jne.
4. Tavoiteltu vaikuttavuus Tässä pohditaan nykytilannetta suhteessa vaikuttavuustavoitteeseen. Mitä on jo saavutettu? Miten tästä eteenpäin? Onko jossain epäonnistuttu ja mitä korjausliikkeitä on tehty? Mitä on opittu?
5. Tahattomat vaikutukset Tässä kuvaillaan muita havaittavissa olevia vaikutuksia, joita hanke on saanut aikaan; niin positiiviset kuin negatiiviset.
6. Taustalla oleva tutkimus Tässä kuvaillaan tämän vaikuttavuustavoitteen toteutumista tukeneet merkittävät tutkimustulokset ja tärkeimmät julkaisut

Huom! Tarinan enimmäispituus on 6 sivua! Tarinassa esitetyt asiat on pystyttävä todentamaan. Kootkaa ja arkistoikaa todentamiseen tarvittava materiaali esim. esityslistat, ohjelmat, lakitekstit, asiantuntijakutsut, tilastot yms.

(Suomen Akatemia 2018)

Appendix 4

Original Finnish extracts:

”…[--] me oltiin tehty just vähän saman sorttinen interventio paljon pienemmässä mittakaavassa vuosia aikaisemmin. Ja tuota, tokihan minua se kiinnosti, koska se oli ihan, siis tää ihan tutkimuksellisesti on ihan sitä, mikä minua muutoinkin kiinnostaa tehdä. Eli, et sen takia olin ihan mielelläni mukana, ja sit se vaan on, se tutkimusraha on niin tiukassa, että totta kai kannattaa osallistua, jos siinä on järkevä juttu tavallaan, minkä voi toteuttaa. Ja täähän on siis, tää sillä lailla ihan hirveän hyvin sopi tähän mun tutkimusaiheeseen ja on ehdottomasti, vähän saman sorttiseen me oltiin haettu itseasiassa konsortioon rahaa akatemialta aikaisemmin, mutta että, et se ei tärpänny. Niin me tavallaan, se oli lähes niinku, ihan periaatteessa ihan samaa tutkimuskysymystä.” (Senior researcher, Interview 5, Q1)

“Se on, se ei sinänsä niinku… Kunhan toi… Must esimerkiks se… Kunhan se ei mee siis, et ne hankkeet… Tai tavallaan se, että nyt kun meilläkin annettiin ensin tää, vaikkapa (tutkimuksen teema) ja sit tavotteena oli tutkii [tutkimusteeman mekanismit]. Et se ei ollu… Se oli tarpeeks lavee se tehtävänanto, siihen väliin, siihen niinku mahtuu todella paljon kaikkee. Et se ei ois pelkästään, jos siinä ois tosi tarkkaan rajattu se johonkin [tietyn aspektin promoamiseen] ja pelkästään [edistää tiettyä hyvin rajattua asiaa] tai joku niinku tosi kapeesti. Ni sillon se ois enemmän just sitä, et nyt ei halutakaan kuulla vaikkapa sitä, et [mitä nämä ovat] vaan sitä, että kuinka [promotaan näitä] vaikkapa. Et se, et nyt se annettiin tarpeeks laveesti, siten et tutkijat saa oikeesti määritellä sen, mitä nyt halutaan tutkia. Ja sillon se ei mun mielest se sen kautta… Ja toinen, sillon ku määritellään nää teema-alueet, ni niiden pitää olla tarpeeks laajoja. Ja toisaalta sitte… Ni sillon ei oo must sellasta niinku poliittista ohjausta siinä, mitä nyt halutaan. Et siit ei pysty lukemaan, minkälaisii juttuja nyt halutaan oikeestaan tai tuloksia.” (Professor, Interview 7, Q2)

”Ja tosiaan vertaisin vähän sitä, että kuitenkin, no vähän lääketutkimukseen, että eihän, jos jotain uutta lääkettä testataan, niin kyllä siinä on se lääkefirma mukana. Ei ne lääkärit ite ryhdy Huhmarissa sitä tablettia tekemään. Että tää on ehkä vähän niin kuin sama asia siinä mielessä.” (Senior researcher, Interview 5, Q3)

”Tää STN-hanke tietysti on siinä mielessä houkutteleva, että se mahdollistaa semmosen vähän pitkäjänteisemmän työskentelyn jonkun tietyn teeman parissa. Mehän toki tiedetään, et yliopistomaailmassa nyt tämmöset hyvin lyhyet työsuhteet on kauheen yleisiä ja sitten tässä meiän hankkeessa on ollu se hyvä, että on lähdetty niinku rakentamaan vähän tämmösiä pidempiä työsuhteita. Se on yks asia.” (Post-doc researcher, Interview 13, Q4)

”Et toisaalta [akateemisessa työssä ylipäätään] vaaditaan semmoista sinnikkyyttä, ja semmoista, et sä jaksat rakentaa pitkäjänteisesti, mut sit taas toisaalta, se mitä ehkä sit rahoituksellisesti tai työpaikkojen suhteen, niin kyllähän se on aika epävarmaa. Eli siinä on tällaisia ristiriitoja ehkä, mä ajattelisin. Nää oon ainakin tämmöisiä, täähän ei oo

mitenkään tuohon, itseasiassa tää hanke, mä koen, että tää oli semmoinen, tää oli mun henkilökohtaisen työelämän kannalta ihan mahtava juttu, että sä saat yhtäkkiä keskittyy, sulla on viiden vuoden rahoitus tai suurin piirtein, niin sehän semmoista, et eihän tällaista oo olemassakaan." (Post-doc researcher, Interview 8, Q5)

"No ylipäätään tutkijana motivoi se, että voi löytää uutta tietoa ja sitten, että sillä on joku merkitys sitten joskus johonkin näin niin kuin. Kuitenkin mä oon tehny aika perus, tai sellaista niin kuin ei mitään kauheen kaupallista siis kuitenkin teilläki tehdään aika eri lailla. Ehkä sitä ei nyt voi kutsua ihan perustutkimukseks, mitä me täällä missään tehdään, mutta siis niin kuin niin perusta, kun [tutkimuslaitos] nyt voi tehä. Ja tuota, niin uuden oppiminen ja löytäminen ja sitten, että tietysti kun on tässä (tutkimusala), niin sitten siinä nyt on, on siinä nyt jonkinlainen linkki sinne silleensä maailmanparannukseen ja semmoiseen, että ilmastonmuutos ja tämmöiset saatas jotenkin hallintaan." (PhD student, Interview 2, Q6)

"(--)… Mut mul on kaks semmosta ehkä tärkeintä motivaatiotekijää tässä hankkeessa. Joista on niinkun se, että musta [tutkimusaihe] on hirveen mielenkiintonen ja tärkeä asia. Ja sitte toinen tässä strategisen tutkimuksen neuvoston hankkeeseen liittyvä motivaatiotekijä, nimenomaan se, että se pyrkii vaikuttamaan. Et sillä on niinku aidosti semmonen tavote, et se pyrkii tuomaan niitä tutkimustuloksia poliittisten päättäjien tietoon ja just niinkun vuorovaikutus kumppaneille ja laajemmin yhteiskuntaan. Et sillä on niinku semmonen, hyvin niinku voimakas semmonen vaikuttavuustavote. Ja se on must motivoivaa, että, et semmosen jonkun hyvän asian puolesta, johon uskoo, niin että sille on tavallaan semmonen legitimiteetti. Et myös yrittää sitä työntää, niinkun niitä ajatuksia muualle. " (Senior researcher, Interview 1, Q7)

"Tää on sataprosenttista rahaa. Niin mun on hirveen helppo sanoo, jos yliopistolla palataan tähän asiaan kohta, mut jos tuntuu siltä, että esimerkiks mun yliopistolla on erilaisia tavotteita kuin Suomen Akatemialla, niin mä voin sanoo, et tuota noin niin kun täs on vähän semmonen juttu, että kun täs on tämmönen taho, mikä tavallaa rahottaa tän homman, niin mun pitää varmaan kuunnella aika paljon nyt niitä. Sitä paitsi me ollaan haettu projektia, asetettu sinne tavotteet, ei me voida niistä lipsua. Ja tää on itse ihan hauska asetelma, koska sillon tavallaan case-yritys, yliopisto, tutkija ja rahottaja, niil on kaikilla riittävästi sananvaltaa siinä asiassa. Ja tavallaan sillon ei synny näitä omalaatusia, monenlaisia tavotteita. Kaksia kalvoja. Jos on rahotettu sata pinnaa, sivukulut päälle, niin mä kysyn, että millä mandaatilla vaikka yliopisto tulee kertomaan sulle, että tää tutkimus, että sun pitäs vähän enemmän tehä jotain asiaa a." (Post-doc researcher, Interview 6, Q8)

"Et ajattelen, et nää molemmat on toki ihan sallittuja ja tärkeitä tapoja tehdä edelleenkin, mutta on kiva, että saa laajennettuu sitä omaa perspektiiviä myös ja oppia uusia tapoja tehdä ja ajatella. Että ehkä ei ihan sellasia isoja mitään niinku että jotenkin tulis uusia, niinku ihan kokonaan uudenlaisia tutkimuskysymyksiä tai muita, mut ehkä sitä niinku jotenkin sitä sen ilmiön niinku kompleksisuus ja eri näkökulmat ja eri puolet, niin niille jotenkin, et ne siinä vuorovaikutuksessa tulee kyllä hyvin esiin." (Post-doc researcher, Interview 13, Q9)

"Ja tässä nyt tässä nimenomaisessa hankkeessa on just se, että kun siinä on nyt mukana sitten tän [yliopiston tiedekunta], tai [tutkimusala], ja sitten tämmöistä niin kuin ja sitten näitä meidän insinöörinäkökulma, ja sitten [yliopiston tiedekunta], niin siinä on päässy vähä näkee erilaista näkökulmaa." (PhD student, Interview 3, Q10)

”Et sinänsä näkökulmat on laajentunu, mut myös tän ilmiön ymmärtäminen mitä me tutkitaan kokonaisuudessaan, tää niinku [tutkimusaihe] niin, niin sen suhteen on kyllä ymmärtäny, että siinä on, ihmiset kattoo sitä tietyistä lähtökohdista tietyllä tavalla, et niinku tuntuu et ymmärtää sen kokonaisuuden, sen ilmiön kokonaisuuden myös paremmin, koska meil on monia eri ryhmiä mukana ja jokanen niinku antaa, antaa oman, vois sanoo näkökulmansa, siihen jossain määrin sitte. Et se niinku auttaa ymmärtämään, et joku voi olla hyvin niinku teknologialähtönen ymmärtämään [tutkimusaihe], joku voi olla tämmönen talous-sosiologinen jopa, ja niin edelleen niin, tai niinku kuluttaja-sosiologinen niinku meil on [partneri] tota tää yks ryhmä joka tekee tätä puolta enemmän ni, et siin on niinkun totta kai aina ymmärtää sen tulkintalähtökohdat sitte.” (PhD, Interview 3, Q11)

”Et siinä mielessä tavallaan tää on tuonu tällaisia sivuprojekteja, jotka on kyllä ihan mielekkäitä, ja joita en varmasti ilman tätä konsortiota ryhtyny tekemään, koska se ei oo mitään sellaista minun ydintutkimusta. Mutta ehdottomasti ihan mielenkiintoista, siis toki minusta on mielenkiintoista, et jos katotaan, yhdistetään tän [tutkimusalan vaikutukset] sit näihin [tutkimusalan vaikutukset]. Et jos sieltä saadaan jotain, et saadaanks sieltä jotain tällaista mittaria, et saadaan kaksi hyvää, kaksi kärpästä yhdellä iskulla tyylisesti.” (Senior researcher, Interview 5, Q12)

”Joo, ettei oo huomattavaa eroa?

No ei sikäli, et nykysin tosiaan ainakin [tutkimuslaitos] lähes kaikki hankkeet on tän tyyppisiä. Sen sijaan jos vertaa yliopistomaailman hankkeisiin, niin ero on iso. Että siel on ehkä sit kuitenkin suhtees enemmän semmosia, vaikkapa nyt Akatemia-rahotteisii hankkeita, joissa se fokus on jossakin ekologisessa tutkimuskysymyksen ratkasemisessa. Voi olla melko spesifiäkin, kunhan se on huipputason tutkimusta. Ja siinä ei välttämät vaadita sellasta monialasuutta, että tärkeintä on saada vaan ne maailman huiput siihen saman tutkimusaiheen ympärille.” (Professor, Interview 9, Q13)

”Meil on, siis tietysti [tutkimuslaitos] on, se oli siis ennenki sektoritutkimuslaitos ja meil on tosi paljon tehty sidosryhmätyötä. Paljon enemmän, kun esimerkiks yliopiston tämmönen perustutkimus perinteisesti. Et meillä on ollu, siis historiallisestikki, tosi paljon yhteistyötä ministeriöiden kanssa ja me ollaan tehty tutkimusta sitten niinkun, esimerkiks Tekes-hankkeita, niitä ei tehdä paljon yliopistolla, mut meillä on ollu aiemminki jo Tekes-hankkeita.” (Senior researcher, Interview 1, Q14)

”Sehän on voinu joissain ryhmissä olla ihan sillei, et se ei näyttäydy, mutta joissain, joiden kanssa mä oon keskustellu, niin siinä on semmoinen, niin, siinä on semmoinen käppi. Kun se vaan on kerta kaikkiaan jotenkin erilainen tapa tehdä tutkimusta ja ajatella. Musta siinä on semmoinen, että se on, miten mä sitä, tää on ihan tyhmä sana, mutta tietyllä tavalla epäreilua, että kun ne sektoritutkimuslaitoksen tutkijat ois jo osanneet valmiiks kaiken tän, niin miks meidän, kun meillä on taas oma pätevyys, niin miks niitä ei voitu valmiiks niitä pätevyyksiä yhdistää, et miks piti tehdä tällainen?” (Professor, Interview 11, Q15)

”Esimerkiksi me kirjotettiin tällainen road map tähän liittyen, ja siinä oli, kuinka mä nyt sanoisin vähän niinkuin vaikea…kaikilta osin olla sen…takana, mitä siinä sanottiin, vaikka siihen mun nimi ja kaikkien nimet tuli. Mutta se, miten roadmap esittää sen [tutkimusaihe, sen kehitys ja edistämisen tavat] niin mä en oo samaa mieltä, että sitä pitäis edistää.” (Senior researcher, Interview 16, Q16)

”Joo, et onks se tieteellinen tutkimus ees jossain määrin vai onks se tällainen hallinnon palveluksessa oleva soveltava vai onks se sitten…” (Professor, Interview 11, Q17)

” [--] koska must tää koko vaikuttavuusjuttu on nyt kyl vaan sellainen, että mua hirveesti ahdistaa ja huolestuttaa se, että miten sitä, miten se käsite määritellään siihen. Koska nyt se, mitä enemmän aika kuluu ja mitä enemmän se on siinä kärkihankkeessa, sitä enemmän se vaikuttavuuden teoretisointi tai vaikuttavuuden käsitteellistäminen tapahtuu tällaisessa hallinnollislääketieteellisessä framessa. Et se oli aluks semmoinen vaan vivahtava, mut nyt se on jo semmoinen ihan suora. Nythän sen projektin tarkoituksena on laskea indi1kaatteja, luoda indikaattoreita ja tehä tämmöistä vaikuttavuustutkimusta, joka sitten, siihen on tullu tää [tutkimuslaitoksen] freimaus kauheen voimakkaasti. (Professor, Interview 11, Q18)

”Mä [hankkeeseen kutsumisen] näkisin tän enemmän tällaisena pelinä, jossa niin kuin katsottiin, että mahdollisuudet saada hanke läpi on hyvin huonot, jos se on pelkästään teknologiavetoinen hanke”. (Senior researcher, Interview 15, Q19)

”Siinä mielessä, että esimerkiksi se tapa, jolla julkisuudessa viestitään tästä hankkeesta, et mä en ehkä tutkijana voi niin kuin asettua julkisuudessa kritisoimaan tiettyjä [tutkimusteema] keskusteluja, joita tällä hetkellä käydään [tutkimusteemasta], jotka mun mielestä on väärää informaatiota siitä, mitä [asioille] voidaan tehdä. Mä en niinku tämän hankkeen tutkijana voi esimerkiksi [naurahtaa] julkisuudessa tän hankkeen nimissä esittää tai sanotaan, että voin tietenkin totta kai periaatteessa, mutta ei se kauhean myönteistä, tai siihen ei suhtauduta kovin myönteisesti”. (Senior researcher, Interview 15, Q20)

”No se riippuu tyypistä. Kun mä oon silleen vaan rivitutkijana, niin mulla on vähemmän vuorovaikutusta. Mutta tuota, kyllä siis tietenkin hankkeen johdolla on tosikin paljon vuorovaikutusta ja silleen…” (Post-doc researcher, Interview 8, Q21)

”Ulkoisesti en osaa sanoa kyllä oikein varmaks, että, mähän en ite ollu tosiaan mukana siinä vuorovaikutus…niin kuin ulospäin.

Okei, et se ei silleen periaatteessa sun työhön silleen vaikuta hirveesti?

Niin, ei, ei. Ei ehkä oikeastaan hirveesti, että mä teen vaan sitä omaani, ja sitten se toivon mukaan joku muu käyttää sitten sitä tulosta eteenpäin. ” (PhD, Interview 2, Q22)

”Joo. No siis kyllä ne niin ku tavallaan toimii tai sopii, mutta mulla edelleenki, jos ihan tutkimuksesta puhutaan, ni se on edelleenki aika niin ku minä-vetoista. Tai siis että... että tota, että jos niin kun haluan, että tutkimus etenee, ni sitten mun täytyy, tai siis mä kyllä varmaankin kirjotan ja teen sen oman tutkimukseni [nauraa].” (Post-doc researcher, Interview 4, Q23)

”Joo, tota onks se jotenkin muuttanu sitä tutkimuksen tekemistä tai tutkijana olemista se, tavallaan tällänen vuorovaikutus, mitä tässä on ollu täs hankkeessa? Tai onks se, koetsä et se?

No, ei sit ehkä kui-, tai siis sehän on et miten paljon vuorovaikutust tekee, niin se on tosi paljon itestä kiinni. Sitä voi jäädä tekee aina kaikessa, et sitähän voi jäädä tekee… tai sit

sitä voi ottaa ihmisiin yhteyttä. Et se on ihan siitä omasta, millä tuulella sattuu olemaan." (Post-doc researcher, Interview 10, Q24)

"Esimerkiks vaikka tarkottaa sitä, että jos käytän jotain tietynlaista mallinnus lähestymistapaa ja sitten toinen tuottaa aineistoa tietyllä tapaa, mut ne ei oo vaikka niinkun yhteensopivia. Ja et kuinka niinkun sellasia, tavallaan niiden tieteiden välisiä yhteensopivuusongelmia, kun niitä saa ratkastua, niin se on tosi semmosta palkitsevaa. Totee, et voi oikeesti tehä semmosta monitieteistä tutkimusta. Mut siihen liittyviä haastavuuksia on just se, että ihan vaikka, kun joskus tuntuu, että puhuu toisten kanssa aivan eri kieltä. Ja kun selittää jotain, niin ei vaan niinku oikeasti ymmärrä, et mitä se oikeasti tarkottaa, mistä se puhuu. Tai sit kun ite puhuu, ni huomaa, että toinen ei. Et niinkun hyvin tämmösiä pieniä asioita, mistä se tulee. Mut tää ehkä nyt kuvastaa sitä, et kuinka haastavaa tämmönen monitieteinen voi olla." (Post-doc researcher, Interview 10, Q25)

"Ehkä yllättävää on se, että miten suuri merkitys sillä loppuen lopuks on ollu, että ne organisaatiot, jotka toimii yhdessä, niin et ne on toiminu jo pidemmän aikaa yhdessä. (Senior researcher, Interview 1, Q26)

"Oon kyl osittain samaa mieltä [kysyessä mielipidettä tutkimuksen politisoitumisen väitteisiin], et jos se koko tiede valjastetaan tämmösten rahotusinstrumenttien kautta, niin kun STN on, ihan ylhäält päin määriteltyjen tutkimustavotteiden orjiksi, niin se ei oo hyvä kehitys, et mun mielest ehdottomasti suurin osa tieteest pitäis tulla silleen bottom up -periaatteella, koska sieltä sit ne isommat löydökset tulee." (Professor, Interview 9, Q27)

"Joo. Itse tutkimusta se ei mun mielest muuta mitenkään, et se niinku sitä tutkimuksen tekoo tai sitä tutkimuksen prosessia tai aikataulujakaan. Et ne tehdään siin ajassa, mikä… Et se ei oo muuttunu mikskään, vaikka on tullu tavallaan paineita nopeempaan julkasuun tai jotain muuta. Mut ei ne… Ne rakenteet ei oo muuttunu mihinkään. Se mikä on siin on muuttunu niinku enemmän, on sit just se, että kun etenkin nää akateemiset tutkijat on tottunu puhumaan siit viimesimmästä julkasustaan niillä rajotuksilla, mihin se keskittyy se tutkimus ja voidaan puhuu vaan siitä, mitä tuloksii tää tutkimus nyt tuotti. Mut se niinku… Sit taas kansliapäällikkö ei oo kiinnostunu siit viimesimmästä, vaan se on kiinnostunu siit, mistä oot tehny nyt sen 10 vuotta tutkimusta ja mitä nyt tälle pitäisi tehdä, kun tää tilanne on näin. Niin sillä tavallaan sit se, mitä se vaatii tutkijalta sitte on sit sen tutkimustiedon ja sen kumuloituneen tutkimustiedon, se ei välttämättä tarkota ees et se on sun tutkimustuloksia pelkästään, vaan sit se, et mitä siit aiheesta tiedetään." (Professor, Interview 7, Q28)

"No kai se nyt sitten taas kerran liittyy siihen, että toisaalta kun kannustetaan tai pakotetaan viestimään siinä, tekemään sitä vuorovaikutusta enemmän ja näyttämään, että sitä on tehty, niin sit se tavallaan pakottaa myös oppimaan tekemään sitä paremmin." (PhD student, Interview 2, Q29)

"En tiä, onko kaikki hankkeet sitte ottanu sitä [nauraa] vakavissaan näitä tiettyjä sellasia, että, eli ehtoja tai tämmösiä niin ku mitä se STN nyt niin ku meinaa.

Joo [nauravat]. Tota, mitä se tarkottaa, et te ootte ottanu sen ihan?

Nii, että ei niin ku sillain, että no, rahat tuli, että me nyt tehään mitä lystätään ja yritetään välillä, että on joku viestintäihminen, joka sit välillä pistää twiittii et jonnekin ja että

näyttäs siltä, että ollaan aktiivisia, vaan meillä se on niin ku jotenki otettu sillain vakavissaan, että nyt sitten harjotellaan tämmöstä uudenlaista, vähä niin ku siks, että meillä on nyt tää ryhmä ja kaikki tutkijat on laitettu kirjo-, tai siis meil ei oo sillain, että me tehtäs tämä, tai et tietyt viestintäihmiset tekis jotain, vaan…

Nii et kaikki tutkijat tekee.

… vaan kaikki tutkijat niin ku twit-, niil on jaettu vuorot, että kirjottaa blogei ja twiittaa ja että tavallaan on otettu se lähestymistapa, että kaikki opettelee nyt sitte uudenlaista suuntautumista maailmaan [nauraa].” (Post-doc researcher, Interview 4, Q30)

”Eikä sitä sisällöllistä puolta kun tässä on kuitenkin tää kauheen haastava se peruskysymys. Ja sitten siin on toinen on sit se, joka siin tuloksellisuudessa on kauheen hankalaa on se, että toisaalta indikaattoreita ja enemmän ja enemmän indikaattorit ja nyt se painottuu selvästikin se keskustelu siihen suuntaan, mut sit toisaalta, koska tämä on akatemian rahoittama projekti, niin toisaalta nää projektin johtajat, ne jakaa sellaisen käsityksen, että pitää tuottaa tieteellisiä artikkeleita. Ja niinpä meillä on ihan se sama [konsortion nimi] tää, että tieteellisten artikkeleitten määrä ja Impact pisteet ja.” (Professor, Interview 11, Q31)

”Mut sanotaan, että jos haluaa yhteiskunnallisesti vaikuttaa, niin mun mielestä tän kaltaset ohjelmat, missä nyt toimitaan, on siitä erinomaisia, et sä voit tavallaan osallistua politiikkaan olematta politiikassa. Et sä voit tarjota, et tämmösiä skenaarioita me ollaan nähty. Sit me voidaan tarkastella näitä vaikkapa liberaalilla perspektiivillä tai voidaan tarkastella näitä vaikka sosiaalidemokraattisella perspektiivillä tai ihan millä tahansa perspektiivillä ja maailmankuvalla. Sit me voidaan tulla erilaisiin tuloksiin näiden skenaarioiden haluttavuuden kanssa. Mut ne skenaariot on tässä.” (Post-doc researcher, Interview, Q32)

”Oli tos vast kollegan kanssa keskustelua siitä, että oli niinku, semmosesta tilanteesta puhuttiin, et se julkasu nyt vähän laahaa perässä. Mut sit kuitenkin on osallistunu paljon semmoseen yhteiskunnalliseen vaikuttavuuteen tai semmoseen työhön. Mut sit se ei niinkun muka sit näillä mittareilla näy missään. Et se on tosi ongelmallista.” (Post-doc researcher, Interview 10, Q33).

”... niin ku muille ihmisille, nii. Nii että palveleeko se sitte sitä, että olis jollain tavalla tietyillä akatemian kriteereillä huippututkija, että olis paljon korkeatasosia julkasuja, niin en ole varma onko se mahdollista tehdä niitä sekä että, mutta tota, mm. Niin sinänsä must on tosi, täähän on tosi semmosta kiinnostavaa ja hauskaa ja mukavaa tämmösessä oleminen sitte [--] tutkiminen on tosiaan se kiinnostava [nauravat] ja näin, että [tutkiminen], mutta että palveleeko se niitä mun tutkijan, no siis tietenki tutkijan urassa ni nykyään on paljon tämmöstä, että pitää olla tämmöstä muutaki osaamista kun tämä, tämä tämä, että on niitä julkasuja, että sinänsä se on ihan, tosi, varmaankin on ihan hyvä olla tämmösessä mukana. Sitte sen mun oman tutkimuksen kannalta, niin näkisin, että sitä olisi noin niin ku huippuunsa helpompi kehitellä ihan olemalla itsenäinen ajattelija…” (Post-doc researcher, Interview 4, Q34)

”Kirjoitettiin lyhyt lehtijuttu [lehden nimi] ja se tuli sitten kyllä aika nopeasti bumerangina sieltä toimittajalta takaisin, että ei tätä näin voi kirjoittaa, että meillä lehdistössä kirjoitetaan tulokset ensin ja sit loppuun jotain detaljee, kun taas tutkijana on oppinu sen, että ensin lähtökohdat ja oletukset, ja sit loppuun tulokset ja johtopäätökset, että lehdistössä se on ihan toisin päin. Et sitten kun on joutunu tämmöisiin, koska

tavallaan STN nyt vaatii, että myös tämmöistä yleistajuista julkaisua tehdään, niin sittenhän siihen on joutunut tekemään, ja sitten on oppinu, että näinkin voi viestiä, tavallaan kohderyhmä huomioon ottaen tästä asiasta. Et se on ollu hyvä kyllä oppia ja nähdä sekin puoli." (PhD student, Interview 2, Q35)

"No toi raportointiprosessi, vaik sanoin, etten ollu siinä nyt mitenkään keskeisenä henkilönä mukana, mut se oli kyllä tosi raskas. Että se vei ihan hirveesti aikaa. Että siihen kyllä käytettiin tunteja ja tunteja. Et se jotenkin, ja se jotenkin hyöty-vaivasuhde ei kyllä siinä kohdannu.

"Niin et se ei toteunut? Joo, en voi sanoo, et se jotenkin, et oma kokemus on sellanen, et se ei ihan kohdannu siinä. Et vaivaa nähtiin aivan tosi paljon sen eteen…" (Professor 7, Q36)

"No se on kauheen, just opittiin tuntee toisiamme ja siitä on nyt, siinä on tehty myös niin, että niitä työsuhteita on hirveen paljon pätkitty. Siinä oli aluks semmoinen, et oli tarkoitus, et ne on aika pitkiä ja nyt ne on kuukauden, parin, jotain puolen vuoden, niin ku keikkaluontoisia, ja silloinhan siitä tulee vielä suurempi hajanaisuus siihen. Niin, mut et se mitä ja voi olla et mä oon kauheen vanhanaikainen ja sit edustan jotain pinttyneitä näkemyksiä, mutta mun mielestä ois pitäny eka lähtee siitä, että ois kartotettu ne erilaiset intressit ja intohimot ja käsitykset ja sitten ne peruskäsitteet myös ja sit lähdetty siitä eteenpäin." (Professor, Interview 11, Q37)

"Et se oli semmonen haaste tietyl taval. sit ylipäätänsä haaste henkilökohtasesti täs STN-jutus on se, et nää on aivan valtavii hankkeita. Plus et sitte etenkin 2015-hankkeet, jossa STN myös opetteli koko ajan, et miten tätä hommaa itse asias aletaan hoitaa, niin me ekat hankkeet opeteltiin… Niinku tavallaan saatiin yhtenä päivänä joku näkemys, et tää menee näin, 2 kuukaut myöhemmin sit todettiinki, et itse asias tehdäänki näin ja tota… Et siel on ollu vähän semmosii käytännön juttuja, et tää on ollu vähän tämmönen, konsortiojohtajat puhuu keskenään ihmiskokeesta, et kattoo kuka selvii vuoteen -21 asti hengissä, että… Et se on ollu vähän semmost opettelua." (Professor, Interview 7, Q38)

"Joo, kyllä. Sillai, et se on ollu sit hankkeen tärkein työntekijä kuitenki, se koordinaattori." (Professor, Interview 7, Q39)

"Niin toki siis myös semmoinen, kun on kuitenkin näissä taitaa olla aika isoista konsortioista ja isoista projekteista kyse aina näissä hauissa, että se ois tosi tärkeetä, että se konsortion vetäjä ois semmoinen niin kuin, siis taitava johtaja ennen kaikkea, ja että sitä jotenkin pystyttäis arvioimaan niissä hakuvaiheissa tai siis siinä. Että sit tää on, ei ainoastaan, ja kun hän ei missään nimessä oo kaikkien alojen asiantuntija, siis tehtäköön se selväksi, ja hän on itekin tehny sen selväks, että hän ei tiedä näistä meidän jutuista niin paljon, kuin me tiedetään, ja hän tietää jotakin omasta alastaan, mutta niin kuin, ja se ei oo tärkeätä osata kaikki asiat täydellisesti, vaan se, että osaa, ymmärtää niin kuin, osaa johtaa ja on kyky oppia sitten oleellisimmat siitä, kuunnella mitä on sanottavaa eri tyypeillä siinä." (PhD student, Interview 3, Q40)

"Mm, nii et tässä meiän tapauksessa, mutta meillähän on semmonen tämä, että kun tässä ei, tässä meiän hankkeessa ni ajatus on, että jotta vois muuttaa tätä [markkinat], ne pitää niin ku muuttaa niitä yri-, organi-, tai siis et niien yritysten pitää olla siinä mukana, koska eihän sitä voi niin ku yliopisto päättää, tutkijat päättää, että no, teiän pitää nyt tehä.

Ja poliitikotkaan ei voi sitä päättää, koska nuo rakentaa, [yrityksen nimi] ja muut rakentaa sitte ite [nauraa]…

… mitä, tai tekee mitä tekee. Ni et jos ei ne oo siinä mukana, ni se on ihan niinku…

… sama et mitä siinä tekee." (Post-doc researcher, Interview 4, Q41)

"No se tietysti keskustelu lisää sitä molemminpuolista ymmärrystä. Et varmaanki jos Sipilänki kanssa oltais keskusteltu vähän enemmän, ni ehkä sieltäkään ei olis tullu näitä kaiken maailman dosentti-kommentteja. Niinku et selvästikkin on joillakin näillä päättäjillä huono ymmärrys siitä, mitä tutkijat oikeesti tekee ja mitä mitä tutkimuksessa tehdään." (Senior researcher, Interview 1, Q42)

"Ja sitten, mut semmosii onnistumisia, niin ehkä jotenkin yleisesti jotenkin aattelen, et meiän tulokset on aika hyvin päätyny tonne erilaisiin päätöksentekijöitten pöytiin ja sitten erilaisiin rakenteisiin, esimerkiks tonne [arviointisuunnitelma] ja muualle. Et selkeesti sitä tietoa, mitä me tuotetaan, niin hyödynnetään." (Post-doc researcher, Interview 13, Q43)

"Mutta onhan siinä oma haasteensa, että tiedon, niinku tällasen tieteellisen tiedon tuottaminen on hidasta. Ja sit monet sidosryhmät toivos sitä tietoo kauheen nopeesti. Ja jotta me voiaan tehä korkeetasosta analyysia ja korkeetasosta tutkimusta, niin sitten tietenkin, me ei voida sen nopeemmin edetä, mitä me pystytään, ja mutta toisaalta taas sitten jotenkin aattelen, et tutkijan tehtävänä on myös raportoida sillai ei ainoastaan sitä omaa tutkimustaan, mutta myös sitä tutkimuksen konsensusta, jota me ei tällä hetkellä, muitten tutkimusten niinku pohjalta jo on. Et tavallaan, et sillä tavalla on kuitenkin pystyny vastaamaan tän tyyppiseen ristiriitaan." (Post-doc researcher, Interview 8, Q44)

"…..meil tuli tutkimusjulkasu ulos. No se kiinnosti sen takii, ku tulokset oli myötämielisiä hallituspuolueiden edustajien näkökulmasta. Ne ajo, tai tavallaan vastas sit just sit siihen huutoon, et he sai argumenteilleen tieteellistä pohjaa. Ni sit siihen liittyen ne halus tietää jotain, et sit päästiin jonnekin työryhmäkeskusteluun sen vuoksi esittelemään niit tuloksii, meiän tutkija kävi siellä. Ja sit sielt tulee tietysti jatkokysymyksiä, et tiedetäänkö tämmösest asiasta. No ei tiedetä, mut meiän aineistol kyl pystyttäs vastaamaan. Ja sit sen kaltasii juttuja voi tulla, et tavallaan sielt tulee tutkimuskysymyksen kaltaisia kysymyksiä ja jos me pystytään niihin vastaamaan, niin sit me… Jos on aikaresursseja, ni sit ehkä jopa aletaan tekemään sen kaltast tutkimust. Mut jälleen kerran se prosessi on sit se, että.. Mut me ei mennä sillee sit, että me tehtäis joku analyysipaperi ilman sit, et… (Professor, Interview 7, Q45)

"Niin. Joo, ja mitä enemmän sitä tulee, niin sitä parempi, et STN-hankkees, jos mä nyt ymmärrän oikein, niin ei ole niin tärkeetä, että pysytäänkö alkuperäsessä suunnitelmassa, kunhan se menee hyvään suuntaan näiden sidosryhmien näkökulmasta, elikkä et sillä on vaikuttavuutta, niin mun mielest se on just tärkeetä, että voidaan saada palautetta ja sitten kohdentaa ehkä uudelleenkin näitä töitä ja tutkimuksia siihen suuntaan, mikä näkyy olevan tärkeetä." (Professor, Interview 9, Q46)

"Sitten meidän kannalta mä ehkä, mitä mä ajattelen, niin tietenkin osittain se, että myös tietyllä tavalla, että heillä on usein aika hyviä näkemyksiä, et meillä oli just tämmöinen neuvottelukunnan kokous ja siellä oli tämmöinen [teema], ja sit käytiin näitten sidosryhmien kanssa keskustelua niistä tuloksista, että mitä mieltä he on näistä tuloksista ja muusta. Ja sieltä tuli mun mielestä hirveen hyviä pointteja aika laidasta laitaan. Ja

semmoisia, niin kun ihmiset näkee sen ehkä sen oman toimintansa kautta sen, et mikä tässä on keskeistä, niin siellä tuli semmoisia paljon semmoisiakin asioita, mä en oo [teeman tutkijana], mut että mitä mä en ollu ajatellu esimerkiksi, että okei, että nää jutut saattaa oikeesti olla aika keskeisiä. Et tietyllä tavalla, että sit sieltä tulee myös, siellä on paljon semmoista osaamista, mikä mun mielestä on ollu itse asiassa ihan hyödyllistä ja sit tietenkin, että kyllähän mekin halutaan sit välittää eteenpäin sitä, mitä me ollaan tutkittu. ” (Post-doc researcher, Interview 8, Q47)

”Olisin ehkä odottanut enemmän sellaista perushapanta suhtautumista, että tukijat tutkii ja me hoidetaan nämä käytännön hommat, että semmosta on ollut vähemmän kuitenkin. [--] Osaltaan tähän voi vaikuttaa se, että vaikkapa nyt firmat niin niitten tutkimuskehityshenkilöstö on vähentynyt ja siellä entistä enemmän ne tutkimus ja käytännön kehittämishommat on siellä normaalien prosessien sisällä ja sitä kautta ehkä…kaivataan lisävoimia ja lisäosaamista, ja sitä on saatavilla näistä hankkeista sitten.” (Professor, Interview 14, Q48)

”Sitten toki jos aattelee tutkijoita, niin meil on joskus tapana ilmasta itseämme vähän monimutkasesti, ja siinä jotenkin koen, että itsekin voisin vähän harjaantua. Että jotenkin osaisi viestiä niistä asioista sillä tavalla, et ihan jotenkin monenlainen ihminen vois ymmärtää sen viestin, koska ei ne nytniin monimutkasia asioita kuitenkaan sitten, ne ei oo niin monimutkasia asioita, etteikö niitä vois ymmärrettävästi selittää. Mutta jotenkin itsellä ne kaikki sellaset käsitteelliset nyanssit ja muut, mistä haluais tutkimuksellisessa mielessä jotenkin pitää kiinni, niin sitten välttämättä ei siinä vuorovaikutuksessa oo niin relevantteja, mutta siit on joskus itse vaikee laskea irti.“ (Post doc researcher, Interview 13, Q49)

”Niin, tai siis tarkoitan sitä, että jos sieltä vuorovaikutuksen sieltä toisesta suunnasta, politiikasta tai päättäjiltä tai jostain tulee joku kysymys, mihin halutaan vastaus, niin sitten tutkimus voi toki koittaa vastata siihen, joskus se saattaa jopa onnistua, mutta siihen ei pidä niin kuin, tai siis se ei saa olla lukittua. Tutkimuksen pitää kuitenkin pystyä sitten ite määrittää se, että onks tää nyt oikeesti, tavallaan niin kuin, halutaanko me vastata tähän vai ei, me voidaan haluta vastata siihen, jos se tuntuu relevantilta, tai sit se voi antaa inspiraatiota tutkia jotain muuta toisaalta. Toki se on ihan hyvä, jos vastaanottaja saa tietää jotain siitä aiheesta.” (PhD student, Interview 2, Q50)

”Niin, niin ja he voi, ja toki, kyllä. Ja hehän voi käyttää sitä toki tavallaan ehkä markkinoimistukena, että täähän ei, niin kuin sanottu, me sanottiin jo alun perin näille yritykselle, että tää ei oo mikään tuotteitten testaussysteemi, koska tämä ei ollu. Ja, että me ei, jos me nyt jotain nähdään siellä [sektori], niin se ei sit oo mikään yksittäisen tuotteen, tai yksittäisen firman tuotteen ansiota, koska tää on [malli]. Et tuota, joo tosta ehkä helposti saa vähän ehkä vääränkin kuvan, et ei niitten yritysten osuus kuitenkaan ei, niin kuin sanottu, raha ei liikkunu siellä mihinkään suuntaan.” (Senior researcher, Interview 5, Q51)